TM 11-321

WAR DEPARTMENT TECHNICAL MANUAL

TEST SET

I-56-E

NOTE. This is a reprint of TM 11–321, Test Set I–56–E, 23 JULY 1943.
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WAR DEPARTMENT · 23 JULY 1943

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TEST SET I-56-E

WAR DEPARTMENT • 23 JULY 1943

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TM 11–321, Test I–56–E is published for the information and guidance of all concerned.

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BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

DISTRIBUTION:

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DESTRUCTION NOTICE

WHY——To prevent the enemy from using or salvaging this equipment for his benefit.

WHEN—When ordered by your commander, or when you are in immediate danger of capture.

HOW——1. Smash—Use sledges, axes, hand-axes, pick-axes, hammers, crowbars, etc.

2. Cut—Use axes, hand-axes, machete, etc.

3. Burn—Use gasoline, kerosene, oil, etc.

4. Explosives—Use firearms, etc.

5. Disposal—Bury in slit trenches, fox-holes, other holes. Throw in streams. Scatter.

6. Use ANYTHING IMMEDIATELY AVAILABLE FOR DESTRUCTION OF THIS EQUIPMENT.

WHAT—1. Smash—Meters and cases.

2. Cut—All internal wires and external cables.

3. Bend—Metal panel of Model 774.

4. Burn—Cases, internal parts, instruction books and test charts.

5. Bury or scatter remainder of all parts after breaking and burning.

DESTROY EVERYTHING

. . . WARNING . . .

The observance or ordinary care in handling this test set will prolong its usefulness.

Don't drop or subject it to heavy jars or shocks. When transporting it in a truck, put it on the seat or on a rubber pad or blanket or other cushioning material to take up shocks.

Don't subject it to moisture . . . Cover it up.

Keep it clean . . . Dirt will impair its operation.

If the glass over the scale becomes cracked or broken . . . replace it to prevent dirt from reaching the movement.

Figure 1
View showing Test Set I-56-E complete with each unit in place in carrying case.

SECTION I
DESCRIPTION

1. GENERAL.—

Test Set I-56-E consists of a set of instruments and auxiliary equipment which is necessary, or desirable, to properly service radio equipment now in use by the various branches of the service.

2. COMPONENTS.—

Test Set I-56-E consists of the following component parts:

1 each Combination Analyzer and Tube Tester Model 774, Type 4 (with 15 adapters, 4 jumper leads, 1 output lead, 1 pair test leads, 1 set of instruction cards.)

1 each Volt-Ohmmeter Model 564, Type 3C

1 each Output Meter Model 571, Type 3A

1 each Technical Manual (for Test Set I-56-E Optional)

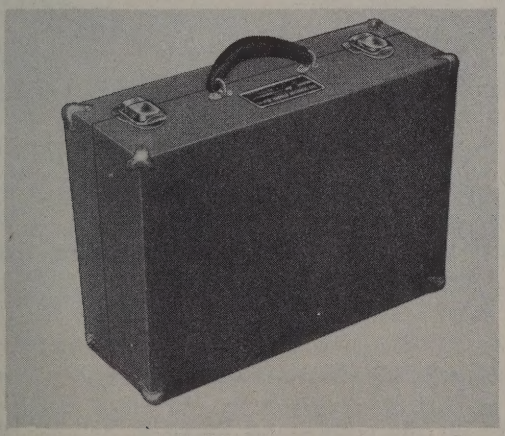


Figure 2
Test Set I-56-E complete in carrying case closed.

Test Set I-56-E, as shown in Figure 1, is contained in a steel carrying case made with compartments for each individual component. The position of the various components when placed in the kit ready for transportation is shown in this photograph. A compartment in the cover of the steel case is supplied for carrying the various instructions. Two locks fitted with identical keys are supplied in the front of the device for locking the complete kit. Figure 2 shows the test set closed and ready for transportation. When the lid is closed the pads in the cover will hold each of the components firmly in position and will also protect them from damage due to external shocks.

Model	Weight	Dimensions
Model I-56-E Test Set	41 lbs.	13¾" x 19¾" x 6⅞"
Model 774 Type 4	17 lbs.	11¾" x 14" x 5⅞"
Model 564 Type 3C	1¾ lbs.	5½" x 3⅝" x 2½"
Model 571 Type 3A	1½ lbs.	5½" x 3⅝" x 2⅞"

3. MODEL 774 TYPE 4 ANALYZER SECTION.—

Model 774 Type 4 provides facilities for testing receiving type vacuum tubes, as well as functioning as an analyzer for obtaining the voltage, current, capacity and resistance data on various radio sets. All measurements can be made by the direct point-to-point method with the test prods connected to the appropriate terminals in the equipment wiring.

Analysis can also be made at each tube socket using the SOCKET SELECTOR UNIT built into the device. (See Figs. 3, 4, & 5.)

Ranges are as follows:

D. C. Volts	A. C. Volts	D. C. Current
7.5	2.0 (Approx.)	1 Ma.
15	7.5	10 Ma.
50	15	100 Ma.
150	50	500 Ma.
500	150	
1000	500	
	1000	

Resistance	Capacity
0 to 10,000 Ohms	0 to .1 μf
0 to 100,000 Ohms	0 to 1 μf
0 to 1,000,000 Ohms	0 to 10 μf
0 to 10,000,000 Ohms	0 to 100 μf

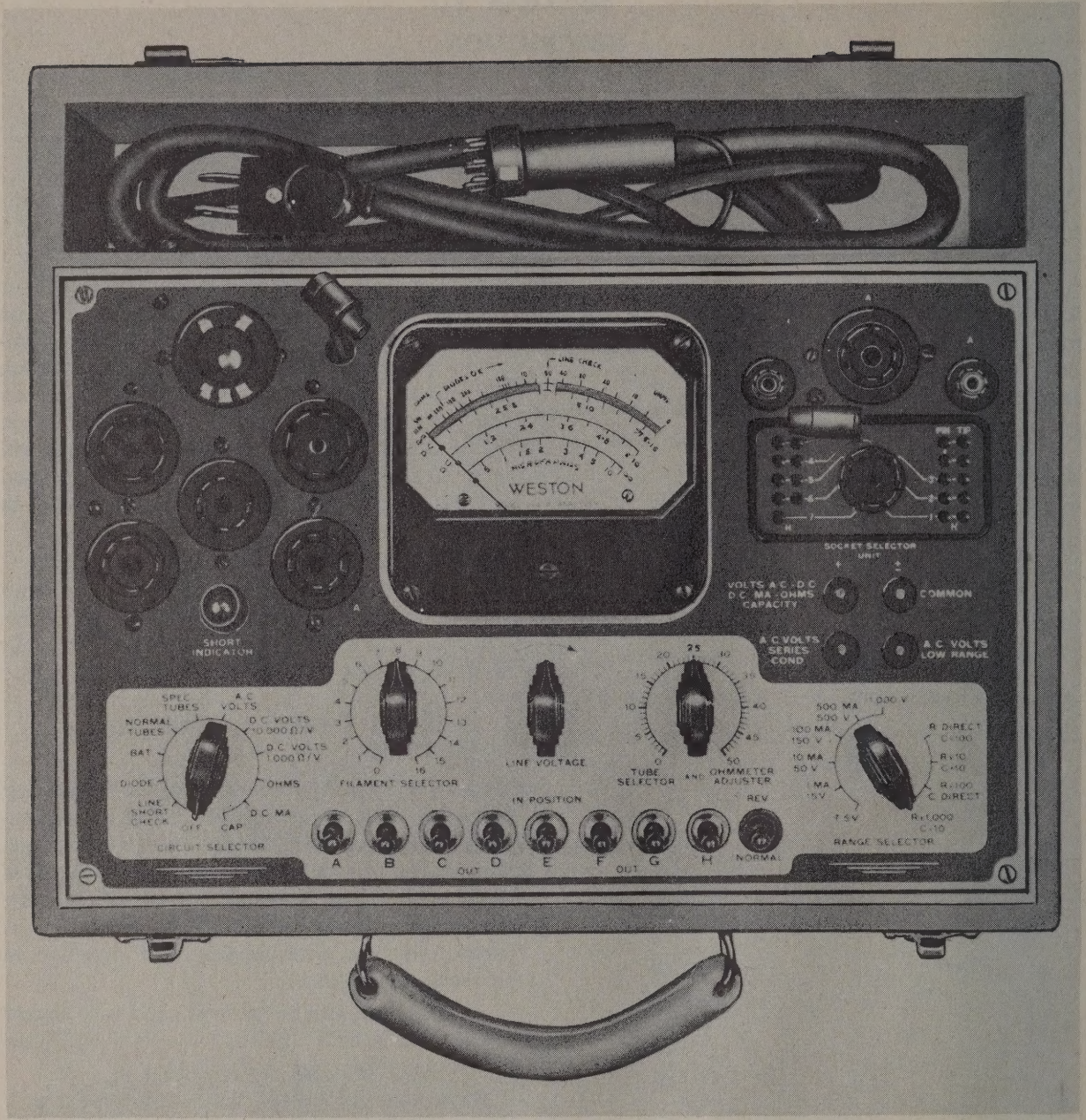


Figure 3
Model 774, Type 4 showing panel, jacks, socket selector unit and various controls.

a. A.C. Voltage Ranges. As illustrated in Figure 3, left-hand, or CIRCUIT SELECTOR, switch sets up the various analyzer circuits as well as the necessary tube tester circuits. Rotate this switch clockwise (right) from OFF, to A.C. VOLTS. In this position, measurements are made through an internal copper oxide rectifier unit.

The individual a-c voltage ranges are next selected on the right-hand RANGE SELECTOR. As indicated, ranges of 7.5- 15- 50- 150- 500- and 1000-volt alternating current can be obtained. Where the approximate circuit voltage is not known, this switch should first be set to the 1000-volt position to protect the instrument.

Insert the pair of test leads with the elbow terminals in the pin jacks marked COMMON and VOLTS A.C. - D.C. found above the

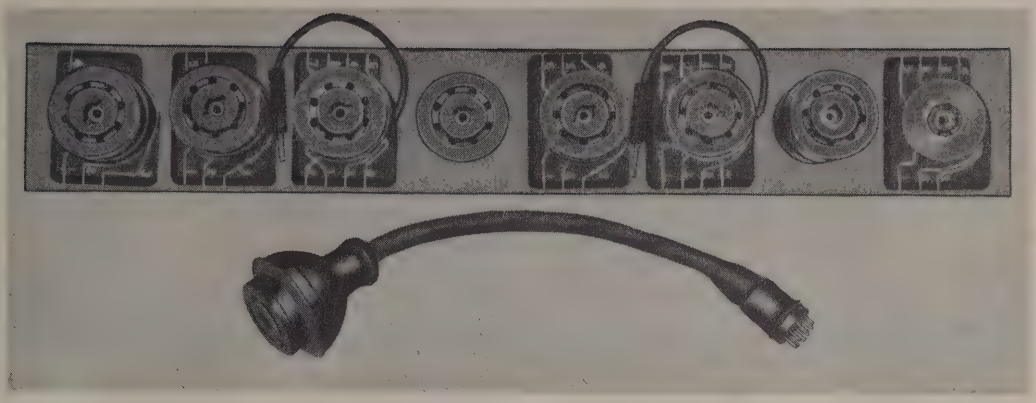


Figure 4
View of adapters used with the socket selector for making analysis of receivers and tubes.

RANGE SELECTOR. The RANGE SELECTOR switch can then be turned counter-clockwise (left) to the various lower ranges to obtain the best instrument deflection. For most accurate readings, a range should be selected, if possible, to cause readings to occur in the upper half of the scale.

b. D-C Voltage Ranges. All d-c ranges terminate at the two pin jacks marked COMMON and VOLTS A.C. - D.C. With the CIRCUIT SELECTOR switch at D.C. VOLTS 10,000Ω/volt, d-c voltage ranges may be selected on the RANGE SELECTOR switch. In this position, a sensitivity of 10,000Ω/volt is provided to permit more precise readings in high resistance circuits. Since most receiver test data is set up on the basis of measurements at a sensitivity of 1,000 ohms per volt, the ninth position of the CIRCUIT selector marked D.C. VOLTS 1000Ω/volt is used when reference is made to such test data in the technical manual of any radio set.

c. Resistance Measurements. With the CIRCUIT SELECTOR set to OHMS, various resistance ranges can be obtained. All ranges operate from self-contained batteries. The upper scale of the instrument is calibrated from 1 to 10,000 ohms. The RANGE SELECTOR switch offers ranges which either divide or multiply the basic scale by the factor indicated at the various switch positions, resulting in full scale ranges of 10,000/100,000/1,000,000/10,000,000 ohms. For measuring electrolytic capacitors for leakage with ohmmeter—polarity of test leads are reversed. "COMMON" lead applies to positive potential to condenser being tested.

d. D.C. Current Ranges. With the CIRCUIT SELECTOR set at D.C. MA., d-c ranges of 1, 10, 100 and 500 Ma. are selected with the RANGE SELECTOR switch.

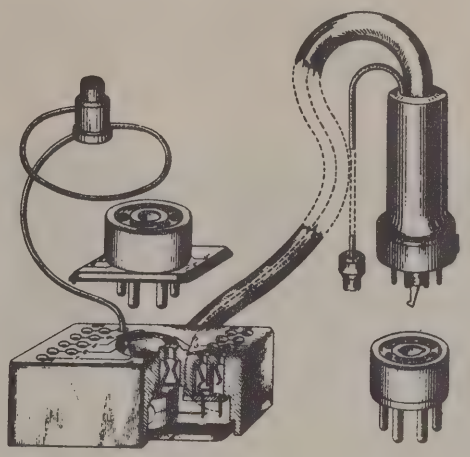


Figure 5
Sketch showing the internal construction of the socket selector unit. Note that the inner jack of each pair breaks the circuit when a pin is inserted. If contact is made to the outer jack the circuit remains closed.

e. Capacity Ranges. Capacity of capacitors in radio equipment may be measured directly on the lower scale of the instrument. Before making capacity measurements, the 115-volt cord and plug should be inserted in a 60-cycle 115-volt source. With the CIRCUIT SELECTOR set at CAP. the RANGE SELECTOR will then provide the various capacity ranges. The capacity scale on the instrument reads from 0 to 10 μf. full scale. The factors for the various ranges are designated at the respective switch positions, resulting in full scale capacity ranges of .1, 1, 10, and 100 μf. All paper or electrolytic capacitors can be checked, but at least one side of the capacitor under test must be disconnected

from the receiver circuit to prevent readings from being affected by associated receiver components.

NOTE: The capacity scale of Model 774 is calibrated for use with 60-cycle current only. On 50-cycle current the instrument will read 5/6 of the correct capacity. Multiply all readings taken with 50-cycle supply, by 1.2 to obtain the correct value. **No attempt should be made to use this equipment on 25 cycles.**

f. Tube Tester. The tube tester section of this model tests for emission, opens and shorts and is used for testing both Signal Corps and commercial types as used in the various radio sets. The device operates from 105-130-volt, 50-60-cycle, a-c line with self-contained potentials set up for reading the emission values of the respective tubes.

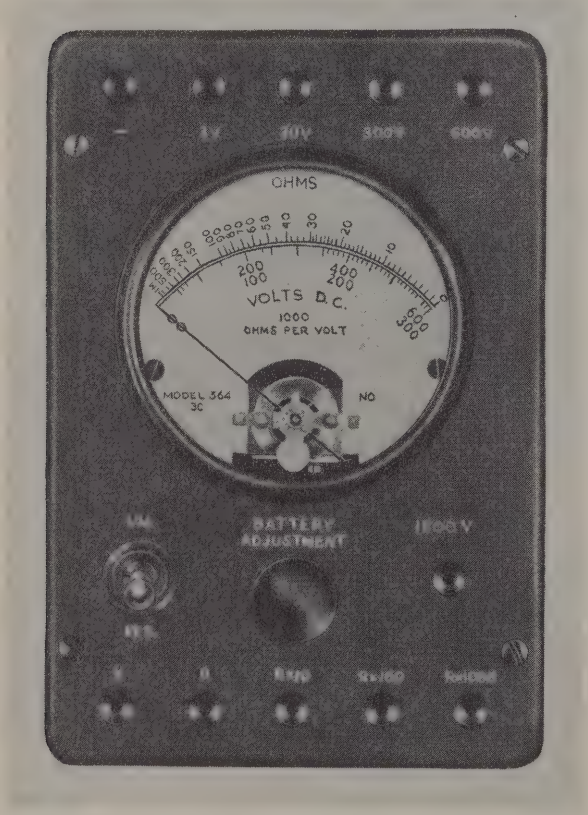


Figure 6
Model 564, Type 3C Volt-Ohmmeter.

4. VOLT OHMMETER MODEL 564 TYPE 3C.—

This instrument is a compact volt-ohmmeter for rapid testing of voltage and continuity. Figure 6 shows a view of the panel with the volt ranges available from pin jacks at the top of the panel and ohm ranges at the bottom of the panel. A voltmeter-ohmmeter toggle switch on the left-hand side of the instrument is used for conversion from voltmeter to ohmmeter. The ohmmeter operates directly from a self-contained battery.

5. OUTPUT METER MODEL 571 TYPE 3A.—

This instrument is used mainly when aligning radio sets, output readings being taken on the instrument while making adjustments in conjunction with a signal generator. The meter includes a constant impedance circuit so that the total impedance across the output posts is 4000 ohms on all ranges. The switch can, therefore, be set to any range without upsetting the load on the output tube of the receiver. (See Fig. 7.)

The instrument operates in conjunction with a full wave bridge type copper oxide rectifier for obtaining the a-c readings. A series capacitor, self-contained in the instrument, is supplied for taking output readings directly from the plate circuit of any vacuum tubes. The capacitor isolates the instrument so that d-c potentials will not cause any damage.

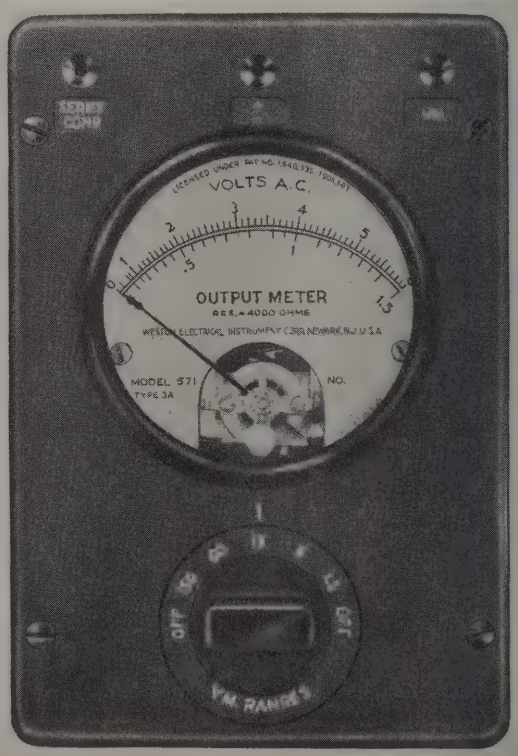


Figure 7
Model 571, Type 3A Output Meter.

INSTALLING BATTERIES

I-56-E Test Sets are shipped from the factory without batteries. Batteries must be installed in the Model 564 Type 3C and the Model 774 Type 4. Follow the step by step procedure given below to put the equipment into operation.

Model 564 Type 3C

1. Remove four panel screws and lift instrument out of bakelite case.
2. Remove the screw fastening the black and red rubber covered leads from the battery clamp mounted on back of meter.
3. Connect black lead to negative of 4.5 V battery.
4. Connect red lead to positive of 4.5 V battery.
5. Place battery in clamp on back of meter with battery terminals facing the pin jacks at the bottom of the panel.
6. Put panel in case and replace four corner screws

Model 774 Type 4

1. Remove four panel screws and lift tester out of wooden case.
2. Disconnect the black, green, red and jumper leads from the positive terminal of the rectangular battery clamp.
3. Connect black lead to negative end of 1.5 V battery clamp. (The two hooked projections on the 1.5 V battery clamp are at the negative end.)
4. Connect the green wire and one end of the jumper lead to the positive end of the 1.5 V battery clamp.
5. Remove rectangular wire clamp.
6. Insert a unicell.
7. Replace wire clamp to hold battery in position.
8. Connect free end of the jumper to negative terminal of 4.5 V battery.
9. Connect red lead to positive end of 4.5 V battery.
10. Put tester in case and replace 4 corner screws.

SECTION II

INSTALLATION AND OPERATION

6. GENERAL TESTS.—

a. Capacitor Leakage Measurements. Capacitor leakage measurements can be taken using either Volt-Ohmmeter Model 564 or Analyzer Model 774. In each case, the capacitor resistance readings are limited to the top scale range on the ohmmeter. By using either of the instruments on the highest ohm range and connecting it across a capacitor, a very high or infinite resistance indication should in all cases be obtained when the capacitor is free from leakage.

Capacitor leakage measurements can also be taken using Volt-Ohmmeter Model 564 on the highest ohmmeter range when connecting it across the capacitor. If it is thought that a particular capacitor has a harmful leakage condition but the maximum range of Model 564 still does not permit an indication of the high leakage resistance, a 45-volt B battery should be placed in series with the high range of Model 564. A 315,000-ohm carbon resistor should be used in series with the battery potential so that when the capacitor charges up, the battery potential will not slam the pointer of the test instrument. This arrangement will provide readings up to approximately 10 megohms. The circuit of these external connections to Model 564 is shown in Figure 8.

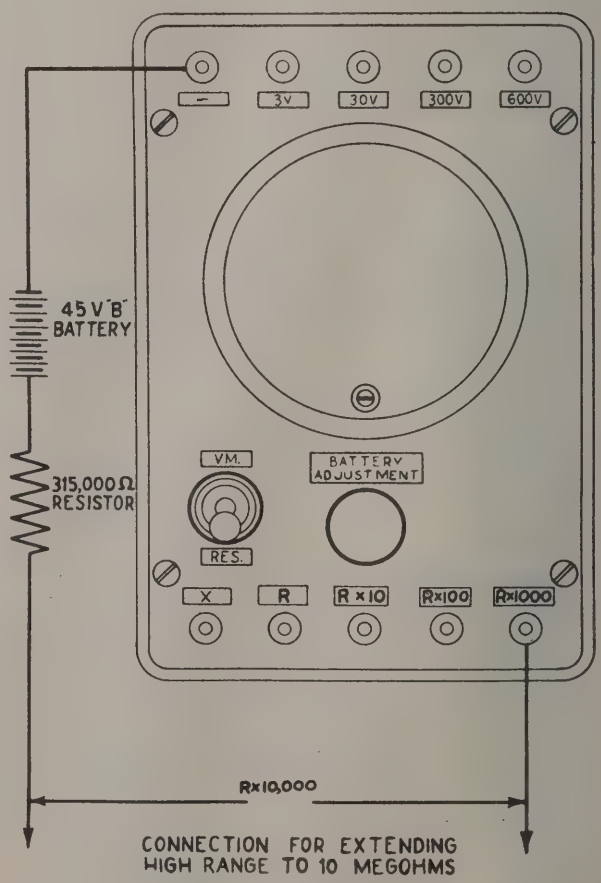


Figure 8
Diagram showing how to extend resistance range of Model 564, Type 3C, Volt-Ohmmeter.

b. Output Tests. Output meter readings on the receiver can be taken using the a-c voltage ranges directly, or when d-c voltage is also present, as in the plate circuit of a vacuum tube, a blocking capacitor is provided at the pin jack, A.C. VOLTS SERIES COND. of Model 774 (Fig. 3). One of the test leads is inserted in this jack, the other remains in the COMMON jack. When output tests are desired at the voice coil or across other low impedance circuits where the voltage conditions are usually limited, a special low uncalibrated range of approximately 2.0 volts alternating current is provided between the COMMON jack and the jack marked A.C. VOLTS LOW RANGE. Set Circuit Selector to A.C. Volts. Range Selector may be in any position.

When taking a-c readings on Output Meter Model 571 Type 3A never use the series capacitor if actual voltages are to be measured as the impedance of the capacitor will vary with the frequency and, therefore, will materially upset the calibration of the instrument. Where comparisons are made in output, the capacitor may be used provided there are no variations in audio frequency.

CAUTION: Use special care in making measurements on radio sets when power is on. This applies particularly to the plate circuits of transmitters which carry potentials dangerous to life.

c. Selective Analyzer. Free point measurements of voltage, current and resistance can be made directly at the tube sockets under actual operating conditions by using the SOCKET SELECTOR UNIT of Model 774 built into the panel just to the right of the instrument. Suitable adapters for the plug and SOCKET SELECTOR block are provided for all receiver type tubes along with the necessary jumper cables. Tube base charts covering standard commercial tubes including the octal, loctal, miniature, and acorn groups are given in paragraph 16. In Figure 4, note that both the block and the skirted adapter carry the numbering for the various pins in accordance with the numbering shown in these tube base charts. The numbering on the block applies to 7-prong tubes. When other types of tubes are measured, the skirt of the adapter covers the numbering on the block, and provides the correct numbers applying to the particular tube under test.

Note that there are pairs of jacks opposite each pin. The outer jacks are used for voltage measurements and connect through to the various pins. The inner jacks are for current measurements and carry small switches which open the circuit when a jumper cable in inserted in the jack. In this way by using the two jacks opposite any electrode, current to that electrode can be measured on any of the milliampere ranges of the analyzer. Figure 5 indicates the internal structure of this block and shows how the small open circuiting switch operates for insertion of the milliammeter.

Tube base charts covering standard commercial tubes, including the octal, loctal, miniature, and acorn groups, are shown in paragraph 15. In using these diagrams remember that the numbers on the base diagrams refer to the same numbering on the selector block and skirted adapters. Duplicates of these charts are supplied in the cover of Model 774 Type 4 Carrying Case.

d. Voltage and Current Measurements with Socket Selector Unit. If a test on all tubes does not clear the trouble, voltage and current measurements should be made on the receiver or transmitter using the SOCKET SELECTOR UNIT. Set up the analyzer and select the adapter having the desired number of tube pins to fit the SOCKET SELECTOR UNIT and fit the other adapter on the end of the analyzer plug. Remove the first tube in the transmitter, or receiver, and insert in the block adapter. Place the analyzer plug in the socket vacated by the tube, and connect the grid lead, if any, to the metal cap on the top of the analyzer plug. Connect the tube cap, if any, to the cap lead on the analyzer block. When making connections to the SOCKET SELECTOR UNIT for voltage measurements care should be taken to plug into the outer jack opposite each pin. Plugging into the inner jack will open the circuit resulting in a reading of 0 voltage. (See Paragraph 6C and Fig. 5.) When making connections to the SOCKET SELECTOR UNIT for current measurements, two leads from the milliampere ranges of the analyzer are plugged into two jacks, one lead into the outer jack, and one lead into the inner jack, opposite the element in the particular circuit to be measured. Plugging into the inner jack opens the circuit to the outer jack and thus places the milliammeter directly in series with the circuit.

If d-c voltage and current measurements are desired, set the CIRCUIT SELECTOR to D.C. VOLTS 1000Ω/Volt or D.C. MA. Reference can then be made under the number of the particular tube being tested, on the tube base charts in Paragraph 16. Two jumper leads are used to connect the tube electrodes to the various instrument ranges.

e. Resistance and Continuity Measurements with Socket Selector Unit. If measurements of this type are desired in place of, or in addition to the volt-milliammeter readings, these can be carried out in very much the same manner by using the SOCKET SELECTOR UNIT in Analyzer Model 774. Instead of connecting the jumper cables to the voltmeter and milliammeter ranges, set up Model 774 for resistance measurements. As most resistance measurements are made with reference to ground, plug the three foot clip lead that is supplied with the equipment into the jack of the analyzer marked COMMON and clip to some grounded portion of the equipment under test. The analyzer pin jack marked VOLTS A.C.-D.C. can then be connected by means of one of the jumper leads to any one of the outer socket selector pin jacks, and the circuit resistance to ground can be measured directly on the instrument.

CAUTION: Before using the ohmmeter, disconnect all potential sources from the transmitter or receiver proper.

7. DETAILED TESTS.—

a. Test for Short Circuit. Refer to tube test data Paragraphs 17, 18, 19. Set FILAMENT SELECTOR as specified. Set CIRCUIT SELECTOR to LINE SHORT CHECK. Insert the tube in the socket carrying the corresponding number of pin holes and allow it to heat up. Rotate LINE VOLTAGE control until meter reads center scale or LINE CHECK. The red electrode switches carrying letters as listed on the instruction card opposite the heading IN POSITION should be thrown one at a time from OUT to IN and back while watching the neon lamp for a short indication. Tap the tube gently with the finger or a pencil while making this test. If any flicker or indication is shown by the neon lamp, reject the tube as unfit for service.

If the tube is of the cathode type, as indicated by a small star ahead of the tube type number throw the A switch to IN for an indication of cathode leakage. Note that when making short tests each switch is operated independently and is thrown to IN and back while watching the lamp. Do not leave any of the other switches in this position while making the test as each switch is used for testing a particular electrode. When the switch is thrown to IN it isolates that electrode at a definite potential in series with the neon lamp from all other electrodes. For this reason each switch should be manipulated by itself.

b. Emission Test. After the short test has been completed, set the CIRCUIT SELECTOR to NORMAL TUBES and throw the switches opposite the headings IN POSITION simultaneously to IN. This gives a total emission test on the tube. Note that for all normal types, exclusive of battery and diode types, the A switch and REV.-NORMAL switch should be kept at OUT and NORMAL when taking the test readings. If the indication on the instrument is in the red or yellow sections of the scale, the tube has emission below normal.

c. Open Element Test. After making an overall emission test, test the emission of each individual element because an open element may not necessarily result in a low reading on a total emission test. To make an emission test of each individual element, set up the instrument in the usual manner for a total emission test and throw each of the electrode switches used in the test to OUT and IN. As this is done, note a slight, or large, change in instrument deflection. If the manipulation of any one of the switches results in no instrument change, the element connected to that particular switch can be considered open, and the tube rejected as defective. For battery or diode types, indicated by a BAT. or a DI. symbol respectively, the CIRCUIT SELECTOR switch should be turned to BATTERY or DIODE as required while making tests on these tubes. After completing such test be sure you return this switch to NORMAL.

d. Tube Testing. Test data for Model 774 Type 4 for Signal Corps as well as commercial type tubes are given in paragraphs 16, 17, and 18. This information is a duplication of the data given on the tube data cards furnished with Model 774 Tube Checker. A card fastened in the lid of the tube checker is used for quick refer-

ence for some of the more commonly used Signal Corps tubes. For data on tubes other than those listed on the card, refer to paragraphs 16, 17 and 18.

In operating the tube tester section of Model 774 Type 4 plug into an a-c line and turn the CIRCUIT SELECTOR to LINE SHORT CHECK. The instrument reading so obtained is in proportion to the line voltage. Rotating the center control, marked LINE VOLTAGE, the instrument is brought to the black line in the center of the scale labeled LINE CHECK. This operation assures correct test potentials, regardless of the line potential. Before inserting a tube for test, refer to the test data charts in paragraphs 17, 18 and 19, or to the card in the lid of the device. Then set the TUBE SELECTOR and FILAMENT SELECTOR switches to the designated positions.

WARNING: Failure to do this may burn out the tube.

Miniature and battery types can be short checked without harm to the tubes. Filaments can not be damaged due to excess emission because a negative d-c potential is applied to the elements to be short checked. The use of d-c prevents damage to the elements themselves and no artificial indication of shorts will be experienced with Model 774.

When using Tube Tester Model 774, Type 4, keep in mind that any one tube may have several symbols indicating that the procedure outlined for each one of the symbols should be followed. For instance, a tube type having a star and double dagger (*††) should be checked in the A socket corresponding to the pin arrangement of the base, and should be also checked for cathode leakage. The symbols used on the tube chart are listed below and it must be kept in mind that any combination of these symbols might possibly be used following the tube type number.

° When short checking, throw B&D toggles to IN and OUT at the same time.

§ When testing for open elements or short checking, throw F&G toggles to IN and OUT at the same time.

** Reject Point is 16 on 50 Line D.C. Arc.

† Throw switch A to IN before inserting tube; keep in this position during complete test. A lighted neon lamp will indicate continuity of third filament connection. No short test; refer to instructions.

* Test for cathode leakage by throwing the A switch to IN when tube is hot; all other switches should be at OUT.

†† Test in "A" socket.

¶ Place NORMAL. REV. toggle at REV.; to short check, throw A toggle to IN, leaving G at IN.

‖ Place NORM. REV. toggle at REV.

& Move grid lead to the cap that gives the higher reading.

°° Tie both tube caps together.

□ When testing for open elements or short testing, B&H toggles should be thrown to IN and OUT at the same time. The same holds true for C&G toggles. Check for cathode leakage.

If all cable connections seem to be in good condition, test the tubes in the defective receiver or transmitter in Tube Tester Model 774, Type 4 using the following procedure:

(1) Plug the device into a 60-cycle 110- or 120-volt supply.

(2) Rotate CIRCUIT SELECTOR to LINE SHORT CHECK.

(3) Set the FILAMENT SELECTOR in accordance with the tube date.

(4) If a single dagger (†) appears following the tube type number, move the A toggle to IN before inserting any tubes.

(5) Insert the tube in the socket corresponding with the proper pin arrangement. If the A socket is to be used, a double dagger (††) will appear after the tube type number on the tube data chart.

(6) Rotate the LINE VOLTAGE control until the pointer indicates at the LINE CHECK mark.

(7) Rotate the TUBE SELECTOR to the figure indicated on the tube data chart.

(8) Now short test the tube in the following manner: Throw the toggle switches at the bottom of the panel to IN and OUT, one at a time. Use only those toggles called for on the data chart under the IN column. If a star (*) follows the tube type number on the data chart, check for cathode leakage by throwing the A

toggle to IN while all other toggles are at OUT. When doing this watch the neon lamp for any indication of shorts.

(9) Following the tube type number on the tube data chart will appear one of the following abbreviations: Di, Bat., or Spec. Rotate the CIRCUIT SELECTOR to the position indicated by the abbreviation. If no abbreviation appears following the tube type number, the tube can be considered a normal type, and the CIRCUIT SELECTOR should be rotated to NORMAL.

(10) Throw the toggle switches at the bottom of the panel to IN as called for on the tube data chart under the IN column.

(11) Note meter indication. If pointer is in the red or yellow section, reject the tube as bad. If the pointer indicates in the green section, proceed as outlined below with the separate element check.

e. Test of Individual Electrodes. Individual elements of a tube occasionally develop an open circuit. In an emission test the grid is closest to the cathode and therefore provides the majority of the emission. The plate, screen grids and suppressor grids contribute in smaller proportions to the total emission reading. Thus, if a screen grid or similar element develops an open circuit, the over-all emission reading may only be affected slightly, and the meter may still indicate a good tube. It is desirable, therefore, to test the individual element emission.

To test each element separately, set the tube checker up for normal test as indicated above, and pull each of the toggle switches, one at a time, to OUT and return to IN. A change in meter indications even if only ¼ of a division, will indicate that particular element is drawing current. When satisfied that all the elements are making connection as indicated by the test given above, the tube may be considered as completely satisfactory.

CAUTION: Do not neglect this test of the tubes.

f. Setting Up Tube Data for New Tubes. Sometimes it is necessary in an emergency to set up tube data for tubes not listed on the data chart. By using the table given below, you can pick proper toggle switches to be thrown to IN. Reference to the base diagram of the tube to be checked will indicate what pin numbers are involved. Determine the type of base, because, referring to the table, the letter opposite the pin number is the toggle switch that should be thrown to IN. For example, 6K7 tubes have elements on pins 3, 4, 5, and the cap. As 6K7 has an octal base, a glance at the chart shows that toggle B corresponds to pin 3, C to pin 4, D to pin 5, and E to the grid cap. Cathode connections on heater type tubes can be disregarded as the toggle switch corresponding to that pin must always be set at OUT.

Wiring of Socket Pins to Electrode Switches

Toggle Switches	Octal	Loctal	Miniature	Large & Small 7	Six Prong	Five Prong	Four Prong	Miniature A	Loctal A	Octal A	Acorn
B	3	2	3	2	2	2	2	1	1	3	2
C	4	3	4	3	3	3	3	7	3	4	3
D	5	4	5	4	–	–	–	5	4	5	–
E	Cap	5	Cap	Cap	Cap	Cap	Cap	Cap	Cap	Cap	Cap
F	6	6	6	5	4	–	–	6	6	6	6
G	8	7	2	6	5	4	–	2	7	1	5
H	1	–	–	–	–	–	–	–	5	2	–
First Filament Connection	2	1	7	7	6	5	4	4	2	7	1

It is also necessary to determine whether the filament connections are normal for the type of base used. If the filament connections are not normal, use the following rule: On the octal based tubes, if one of the filament connections is on pin 2, check the tube in the regular octal socket. If, on an octal based tube, one of the filament connections terminates at 7 and the other end of the filament terminates at any other pin except pin 2, use the octal A socket.

On Loctal tubes, if one filament connection terminates at pin 1, check the tube in the regular loctal socket. If a loctal based tube has one end of its filaments connected to pin 2, and the other end to any other pin except pin 1, use the loctal A socket.

On a miniature based tube, if one end of the filament terminates on pin 7, check the tube in the regular miniature socket. If a miniature based tube has one end of its filament connected to pin 4 and the other end to any other pin except pin 7, check the tube in the miniature A socket.

CAUTION: Watch for tubes with center tapped filaments or tubes with three filament connections. All such tubes require that Switch A be at IN before placing the tube in the tester. All other tubes are checked in sockets corresponding to their pin arrangement and therefore will cause no difficulty.

Filament Potentials. Do not fail to take into account the type of tube that is to be tested. In other words, is it a diode, battery, normal, or special type? Use the DIODE position for diode types and for those battery types in which the load on the tube is too great. It is easy to determine whether the load is too great by placing the tube in the socket and turning the CIRCUIT SELECTOR to BAT. If the meter indication begins to drop off, the load placed upon the tube is too great and the DIODE position should be used instead.

Use the BAT. position for those tubes having more than two elements and having filament voltages corresponding to the 1.5- and 2-volt types. Also use the BAT. for certain 2.8- and 4-volt tapped tubes.

Use the SPEC. Tubes position only on tubes of cold cathode rectifier types, such as the OZ4.

All other types should have the CIRCUIT SELECTOR turned to NORMAL TUBES during test.

The filament potentials provided by the FILAMENT SELECTOR switch are as follows:

Filament Selector Position	Filament Voltage	Filament Selector Position	Filament Voltage
0	1.1 volts	8	13 volts
1	1.5	9	27.5
2	2	10	35
3	2.5	11	47
4	3.3	12	70
5	5	13	85
6	6.3	14	100
7	7.5		

After determining the CIRCUIT SELECTOR and FILAMENT SELECTOR positions and the toggle switches to be used, rotate the TUBE SELECTOR control around to 50 as a preliminary setting. Then after the tube is inserted and warmed up, rotate the TUBE SELECTOR control back to the left for an approximate reading of 36 on the 50-volt d-c scale.

Data established on this basis is not completely accurate but, in an emergency, will provide a reasonable idea of tube quality until more accurate data can be obtained from the manufacturer.

CAUTION: When setting up emergency data be sure to give proper attention to diodes, battery types and other special tubes. Failure to observe such special types may result in tube damage.

CAUTION: Use great care in measuring potentials over 100 volts especially if the test prod leads are worn or aged.

NOTE: In all cases when shooting trouble with the analyzer or volt-ohmmeter refer to the wiring diagrams. Where part numbers are given under Voltage and Current Measurements they refer to the replaceable parts lists for the Signal Corps equipment.

8. TEST OF A TYPICAL RADIO SET WITH THE I-56-E.—

a. The general method of servicing a radio set is as follows:

(1) Check everything external to the equipment.

(2) In the case of a receiver, localize the trouble by starting with the output tube and working back through the set to the input circuits. In the case of a transmitter, start with the oscillator and power supply and work forward to the output. If the transmitter has an audio amplifier and modulator unit, localize the trouble by starting with the modulator tube and work back to the microphone or input circuit.

(3) In all cases, check one tube stage at a time and be sure it is operating properly before proceeding to the next stage.

Many receivers and transmitters contain high voltages which are dangerous. Always turn off the receiver or transmitter when making any changes or removing plugs or tubes from their sockets. Always read the technical manual or

service notes that accompany any equipment before attempting to repair it.

b. Transmitter or Receiver. Before using any part of Test Set I-56-E read this manual. Study the instrument and become familiar with the switches and controls and their functions.

(1) Before making any electrical checks, inspect the equipment mechanically to make sure that all cables, dynamotors, batteries, antennas, antenna leads, grounds and ground leads, microphones, speakers or earphones, show no visible mechanical or electrical defects. Read the instructions with the equipment to make sure that everything is properly connected.

(2) Using Model 774 or Model 564 of Test Set I-56-E, make a continuity check of all external apparatus and such external continuity checks of the units that are possible. If a chart of resistor values for the equipment is avaliable, check these values with the chart.

Particularly look for any direct short circuits which may damage the apparatus when the power is turned on.

If any short circuits are found, repair them immediately before proceeding any further. Check all fuses used. A sudden surge may have burned out one.

c. Receiver. Using the Model 774 of Test Set I-56-E, check all of the tubes in the receiver for emission and short circuits. Check carefully the proper settings of the rotary and toggle switches for each type of tube with the tube charts located in the lid of Model 774. To avoid replacing tubes in the wrong socket, check one tube at a time and if it is good, put it back in the socket from which it was removed. If it is defective, replace it immediately with a tube that is known to be good.

(1) Turn the receiver on and look for any damaging breakdowns in the receiver or connecting cable. If any appear, turn off the receiver and repair the breakdown before proceeding further. Check everything external that is connected to the receiver.

(2) **Free point check.**—Remove receiver from cabinet and starting with the output tube, remove the tube from its socket, select the proper adapter from the I-56-E and plug the cable from Model 774 into it and then the cable into the tube socket. Plug the tube into the proper socket on the panel of Model 774. Consult paragraph 3 for the proper settings of the switches and controls.

(3) By means of the current and voltage jacks on the Model 774, check the voltages and current of tube elements. If a voltage chart is available, compare the readings with those on the chart. They should be within 20% if the output stage is operating properly and the B supply voltage is normal. A click should be heard in the headset or speaker when a voltmeter is connected between cathode and control grid of the output tube.

(4) If the output tube is a pentode and the screen voltage is normal, but there is no plate voltage, the trouble probably is in the output transformer. If there is no screen or plate voltage, the trouble is in the power supply unit or cording. Check each part of the power supply such as power transformer, rectifier, vibrator, filter choke, filter capacitors, bleeder resistors and by-pass capacitors.

(5) Using the voltmeter section of the Model 774, check the voltage at the input to the power transformer, at secondaries of the power transformer; check the output of the rectifier, and at each stage of the filtering system, until the B supply to the output tube is reached.

In using Model 774 for this voltage check, be sure that the proper voltage scale is selected, whether the voltage is alternating current or direct current and that it is read on the correct range of the instrument. Also be sure that the normal rated voltage of the power supply is within the maximum voltage rating of the instrument to prevent damage to the meter or any of its multiplier resistors.

(6) With the output stage operating properly, turn off the set, remove the analyzer plug from the output tube socket, and return the tube to its socket in the set. Select the proper adapter, check the preceding audio stage (if there is one) in a similar manner and compare the readings with the voltage chart of the set. If any of the voltage readings are abnormal, trace each circuit element of the audio stage, checking all of the resistors

and capacitors immediately connected with it.

(7) Return the audio tube to its socket and connect the analyzer plug to the detector socket. If the detector is triode or pentode, voltage checks may be made in the same manner as the audio stage. If the detector is a diode, no voltage measurements can be made, except the filament voltage.

(8) A rough check of the detector may be made by switching the meter of Model 774 for resistance and touching the two test leads to the plate and cathode of the diode. Be sure that any controls in the audio circuit are turned to maximum volume. A loud click should be heard in phones or speaker if the audio portion of the detector circuit is operating.

(9) Return the detector tube to its socket. Selecting the proper adapter, check the voltages of each intermediate frequency stage, starting with the last one. When using the Model 774 for voltage and current checks on intermediate frequency stages, r-f oscillator mixer stage and r-f amplifier stage, only static voltages and current can be measured because the capacity of the analyzer cable will detune the circuit to which it is connected.

(10) In the case of the oscillator, the cable capacity may stop the oscillator from operating. In these cases, the static conditions may be different from the dynamic or operating conditions. After the i-f stages have been checked, a static check of the oscillator and r-f stages should be made in a similar manner.

(11) If the above checks have not located the source of trouble, first check the oscillator for operation by measuring the grid current. Unsolder the ground or low potential wire of the oscillator grid return.

(12) To use Model 774 as a milliammeter, connect it between the wire, just unsoldered, and ground. The positive side of the meter connects to ground. Turn the set on and read the grid current on the meter, selecting the scale that gives the highest reading on the meter scale.

(13) On most receivers, this current is never over one milliampere. The product of the grid current times grid resistance is the r-f voltage produced by the oscillator. If there is no grid current, or only a very slight indication on the meter, the tube is not oscillating. Check all of the component parts of the oscillator coil for open circuit or shorted turns, and replace the defective element.

(14) With the oscillator operating properly, check the parts of each circuit of the receiver, such as the automatic volume control circuit. All resistors and capacitors connected with it should be checked for open and short circuits and also for their correct values. Starting with the last i-f stage, such continuity checks as are possible, should be made on the i-f and r-f stages to determine whether the coils, accompanying by-pass capacitors, or r-f filter resistors are shorted, open, or have changed value.

(15) If a signal generator is available, an alignment check should be made in accordance with instructions for that particular receiver, using Output Meter Model 571 of I-56-E as an output indicator.

(16) Volt-ohm Tester Model 564, has a higher d-c voltage range than Model 774 and, being smaller and easier to handle, may be more convenient for making d-c voltage measurements and continuity or resistance measurements within its range than Model 774.

d. Transmitter.—Check all external parts directly connected with the transmitter, such as cables, connecting plugs, etc. If the power source is not from the transmitter, check it for proper power output.

(1) Using Model 774 unit of I-56-E, test such tubes as possible in the emission checker for emission and short circuits. Most transmitters have either meters built into the unit, or jacks available in which to plug meters in order to check performance. If the oscillator tube is not operating, the readings at all of the metering jacks may not correspond to the chart for the transmitter.

(2) After all the external parts of the transmitter have been checked and repaired, remove the transmitter from its rack or case, following the instruction for the particular unit. Start with the oscillator unit, using either Model 774 or Model 564 unit of I-56-E for continuity and voltage measurements. BE SURE THAT THE VOLTAGES TO BE

MEASURED ARE WITHIN THE RANGE OF THE METER USED OR THE INSTRUMENT MAY BE DAMAGED BY EXCESSIVE VOLTAGES. If the oscillator is crystal controlled, either check the crystal in another unit or replace it with one known to be good. Check all of the parts associated with the oscillator unit, replacing those that are defective.

(3) Using the same instruments, check each successive doubler, tripler or amplifier stage. If the tubes cannot be checked, replace them with tubes of the same type known to be good. After the r-f section has been fully checked and defective parts replaced, align the transmitter following the instructions for that unit.

(4) To test the modulator section of the transmitter, start with the audio output or modulator tube. If the voltage range of Model 774 unit of I-56-E permits, and the adapters are available for the tubes used, use the SOCKET SELECTOR and check voltage and current of the modulator tube. If there are no voltages, or the voltages are low, check all of the parts associated with the modulator stage and the connection to the power supply. Repair or replace the defective parts, using Model 774 or Model 564 as a check means.

(5) Make the same check of each successive stage of the modulator amplifier. Check all values of current or voltage at the available meter jacks or the built-in meters.

SECTION III
FUNCTIONING OF PARTS

9. MODEL 774 TYPE 4.—

a. The large instrument in the light wood case is Model 774, Type 4, a combination tube checker, volt-ohmmeter, capacity meter, and analyzer. The instrument has a basic sensitivity of 100 microamperes and an internal resistance of 1,238 ohms. It is connected for the various types of measurements, such as tube testing, d-c volt measurements, ohms, etc., by means of the left-hand, or CIRCUIT SELECTOR, switch. The right-hand, or RANGE SELECTOR, switch is not used for tube testing, but is required to select the particular volt, ohm, milliampere, or capacity range required.

b. The tube tester section includes an emission tube checker with separate loads for diodes, battery types and cathode or so called normal types. Selection by type using the CIRCUIT SELECTOR connects 5000Ω, 1000Ω, and 200Ω respectively into the electrode circuits. Each red handled toggle switch connects to a socket pin so that continuity and short tests can be made by using each switch individually. A d-c potential of approximately 120 volts is developed by the transformer and the type 71A rectifier tube, operating as a diode. As each switch is thrown to IN, the corresponding element is separated from all other electrodes, and connected with the d-c potential and neon lamp in series to the return circuit. Should there be a short or resistance equal to ¼ meg. or less, to any other electrode including cathode, filament, and shell, the lamp will glow. This ¼ meg. value is obtained by shunting the neon lamp with a resistance network.

c. A normal-reverse switch is required for a few new types where the plate of the rectifier section is connected to a tap on the tube filament such as in the 70A7-GT. This effectively reverses the meter so that it will indicate the cathode condition by an up-scale deflection.

d. The d-c meter operates as a milliammeter in series with a measured potential, an accurate low resistance and the tube electrodes. A ring shunt circuit with a calibrated control (TUBE SELECTOR) provides the means for adjusting the sensitivity for each tube. The tube under test acts as its own rectifier converting the alternating current from the transformer into direct current, as indicated by a steady meter deflection.

e. As a capacity meter, the meter is connected to a full wave bridge type rectifier, in series with an a-c potential and adjusted current-limiting resistance. The a-c potential is adjusted by means of the LINE VOLTAGE potentiometer until the required full scale current flows through the meter, with the test leads shorted. The leads are then connected across the condenser under test, and the reduction in current flow due to the series reactance of the condenser is measured. This is calibrated in terms of microfarads on the meter scale.

f. As an ohmmeter, the instrument operates as a d-c microammeter in series with measured fixed resistance and either a 1.5- or 6-volt battery. The ratio of unknown to known resistance is indicated on the meter in terms of resistance calibration on the scale. The current sensitivity of the meter is adjusted by means of the OHMMETER ADJUSTER to take care of battery potential variation. This is the 15,000-ohm, or high resistance, section of the dual potentiometer.

g. As a d-c voltmeter, the meter is used directly with its 100 microampere sensitivity in series with measured 10,000-ohm per volt resistors for the various ranges. This requires a total resistance of 10 megohms for the highest range. For 1000 ohms per volt, the 1MA. position of the ring shunt is used for meter sensitivity, with 1000 ohms per volt adjusted resistors for each voltmeter range.

h. As an a-c voltmeter, the meter is used with a rectifier network and separate shunt, for 1

milliampere a-c. The 1000 ohms per volt resistors used for the d-c ranges are also used for the a-c ranges.

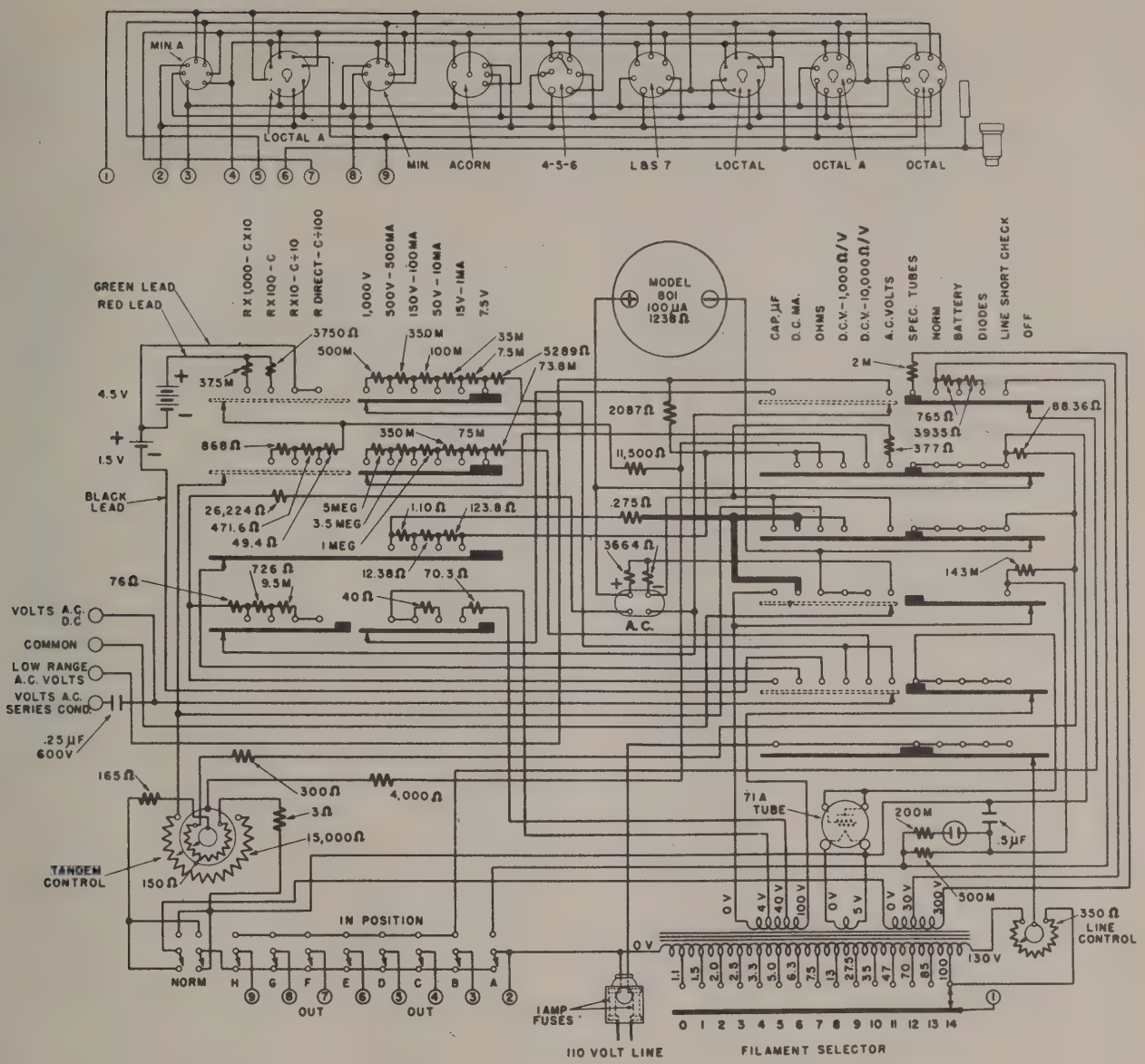
10. VOLT-OHMMETER MODEL 564, TYPE 3C.—

This is a compact volt-ohmmeter, having a basic sensitivity of 100 microamperes. A toggle switch is provided for connecting the instrument as either an ohmmeter or a voltmeter. When the toggle switch is at VM, the instrument is shunted to a basic sensitivity of 1 milliampere, and the necessary series resistors connected to the respective voltmeter pin jacks provide the indicated ranges of 3-, 30-, 300-, 600-, and 1800-volt direct current.

With the toggle switch at RES., the full sensitivity of the instrument is utilized and appropriate resistor networks are connected to the various resistance pin jacks in series with a 4.5-volt battery to provide resistance ranges of 1,000, 10,000, 100,000, and 1 megohm maximum. In the ohmmeter circuit will be found a 10,000-ohm variable rheostat and a 2,000-ohm fixed resistor. (See Fig. 11.) This resistance circuit constitutes a variable shunt directly across the instrument terminals, thereby providing for the necessary compensation needed to adjust the ohmmeter circuit for various conditions of battery potential.

11. OUTPUT METER MODEL 571 TYPE 3A.—

This instrument is designed around a d-c instrument having a basic sensitivity of approximately 250 microamperes direct current, and is adjusted at the factory in conjunction with a copper oxide rectifier to provide a final sensitivity of 375 microamperes alternating current. Connected between the instrument rectifier and the selector switch is an appropriate resistor network to provide a constant impedance of 4,000 ohms on ranges of 1.5-, 6-, 15-, 60-, and 150-volt alternating current. (See Fig. 12.) A constant impedance is necessary in order to maintain a constant load when taking measurements in the output circuit of a radio receiver. All ranges terminate in appropriate pin jacks at the top of the panel. The extreme left-hand pin jack connects to a 0.2 μf series capacitor. This capacitor is used to isolate any direct current which may be present in the circuit where a-c signal voltages are to be measured.



NOTES

Corresponding circled figures connect together.

"Range Selector" (4 deck sw) shown in 7.5V position.

"Circuit Selector" (6 deck sw) shown in "Spec. Tubes" position.

Abb. "M" 1,000; example, 143 M=143,000.

Abb. "Meg." 1,000,000; example, 5 Meg.=5,000,000.

Figure 9
Diagram of internal connections of Model 774 Type 4.

SECTION IV
MAINTENANCE

12. GENERAL.—

Several of the component parts of Test Set I-56-E are equipped with self-contained batteries or with fuses for the protection of the device. The following instructions are for replacing these batteries and fuses:

13. MODEL 774 TYPE 4.—

a. On the ohmmeter ranges of this unit, the current is supplied from two self-contained batteries fastened inside the wooden case. If these batteries fall off in potential due to use or shelf depreciation, the BATTERY ADJUSTMENT will have to be turned higher each time the instrument is used. When complete rotation of BATTERY ADJUSTMENT will not bring the pointer to top scale, replace the battery. To do this, remove the four corner panel screws and lift the complete tester out of its case. This will provide access to the 4½-volt battery and the 1½-volt battery in the wood case. To remove the 1½-volt unicell, place the thumb over the positive battery end of the clamp pressing toward the battery, and pull up the wire clamp. The clamp can be removed entirely, and the battery lifted out of the clips. Put in the new battery, and place the open end of the wire clamp

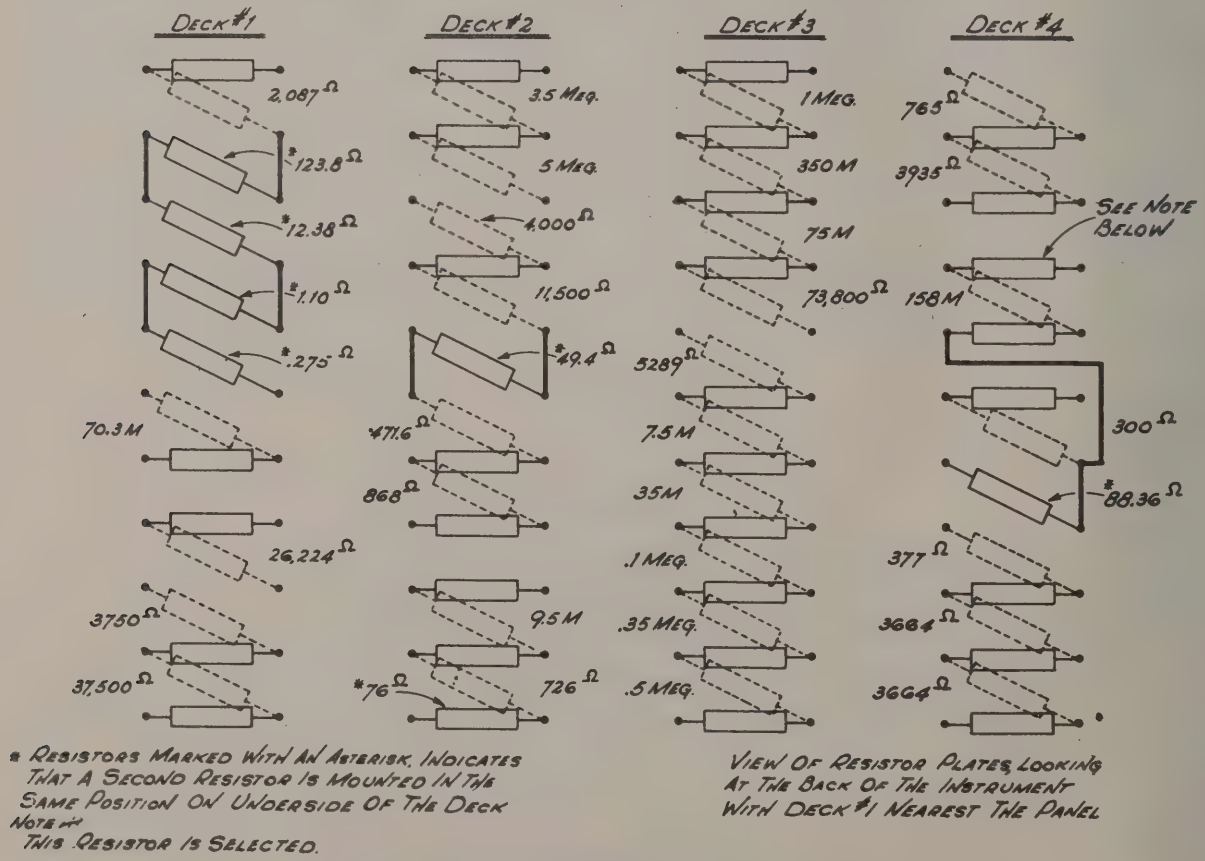


Figure 10
Layout of resistor strips.

over the two projections at the negative battery end, and snap the clamp down over the thumb spring at the positive end. The operator should carefully check the connections to the new batteries. After fastening the batteries into position, the tester may be placed in the case and the four corner panel screws tightened. If replacement of one or both of the batteries does not correct the trouble, or if the tester does not function properly on the volt or milliampere ranges, it should be turned in as defective. Do not attempt to fix the instrument, as considerable damage may be done if the operator is not entirely familiar with this type of equipment.

b. Tube Tester Model 774 contains a transformer operating on the a-c line for supplying the electrode potentials to the tubes. Two one-ampere fuses are contained in the plug at the end of the 115-volt cord, to protect the tester from overload. Should the device fail to function when plugged into a line known to be alive, the one-ampere fuses should be removed and replaced. This is done by merely pushing the fuses out of the plug with a pencil or some other suitable implement.

c. If the tester still does not function or if no LINE CHECK reading is obtained with the tester turned on, examine 71-A RECTIFIER TUBE mounted inside the device. If it is burned out, replace with a new one of the same type. **CAUTION: No attempt should be made to correct defects other than those mentioned, as doing so may cause serious damage to the device.**

14. MODEL 564 TYPE 3C.—

This device contains one 4½-volt battery to supply current for the ohmmeter ranges. If the potential of this battery falls off due to use or shelf depreciation, rotate the BATTERY ADJUSTMENT further each time. This is especially apparent on the low ranges where considerable current is drawn. When complete rotation of BATTERY ADJUSTMENT will not bring the pointer to the top scale division replace the battery. To do this, remove the four panel mounting screws and lift the tester out of its case. The battery will be readily accessible on the back of the instrument. Note the color coding of the battery leads, the **red** lead connecting to the positive terminal.

CAUTION: Should the above recommendations fail to correct the trouble or should the instrument not function properly in any other respect do not attempt to fix the device as considerable damage may be done if the operator is not entirely familiar with the repairing of this type of equipment.

15. MODEL 571 TYPE 3A.—

No attempt should be made to service this device, as doing so may cause serious damage.

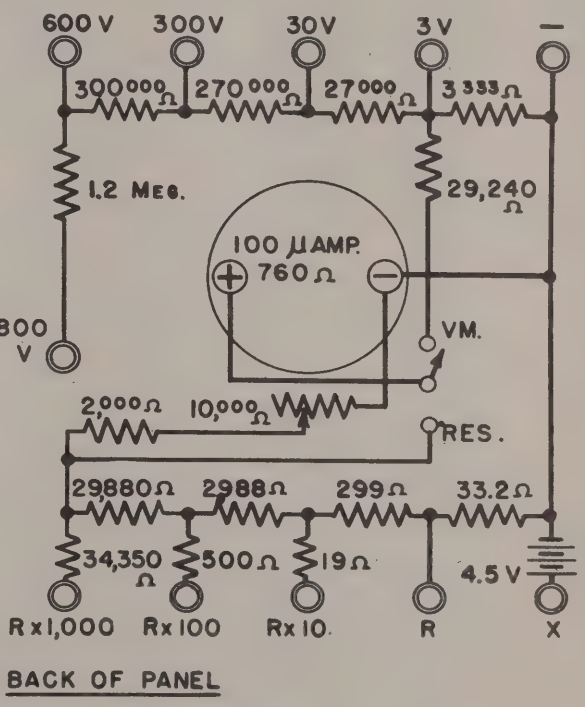


Figure 11

Diagram of Model 564 Type 3C Volt-Ohmmeter. Looking at back of panel.

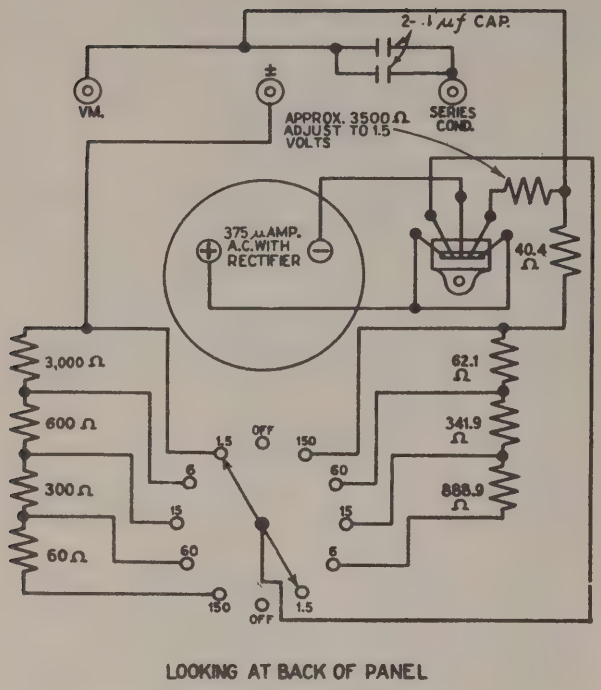


Figure 12

Diagram of Model 571 Output Voltmeter. Looking at back of panel.

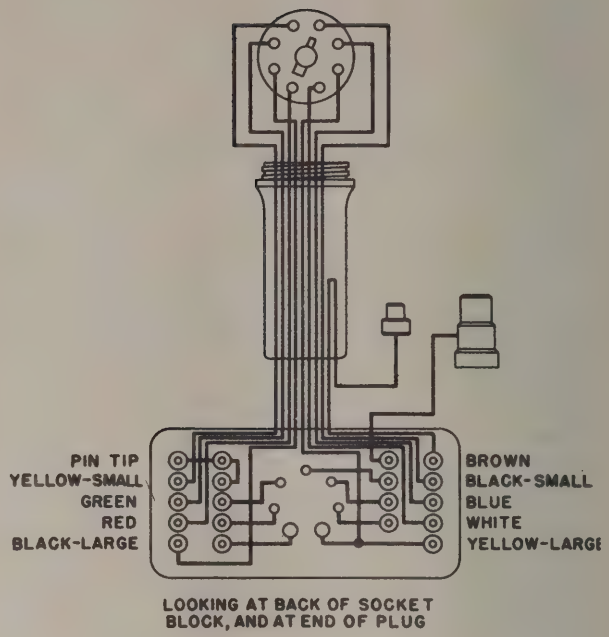


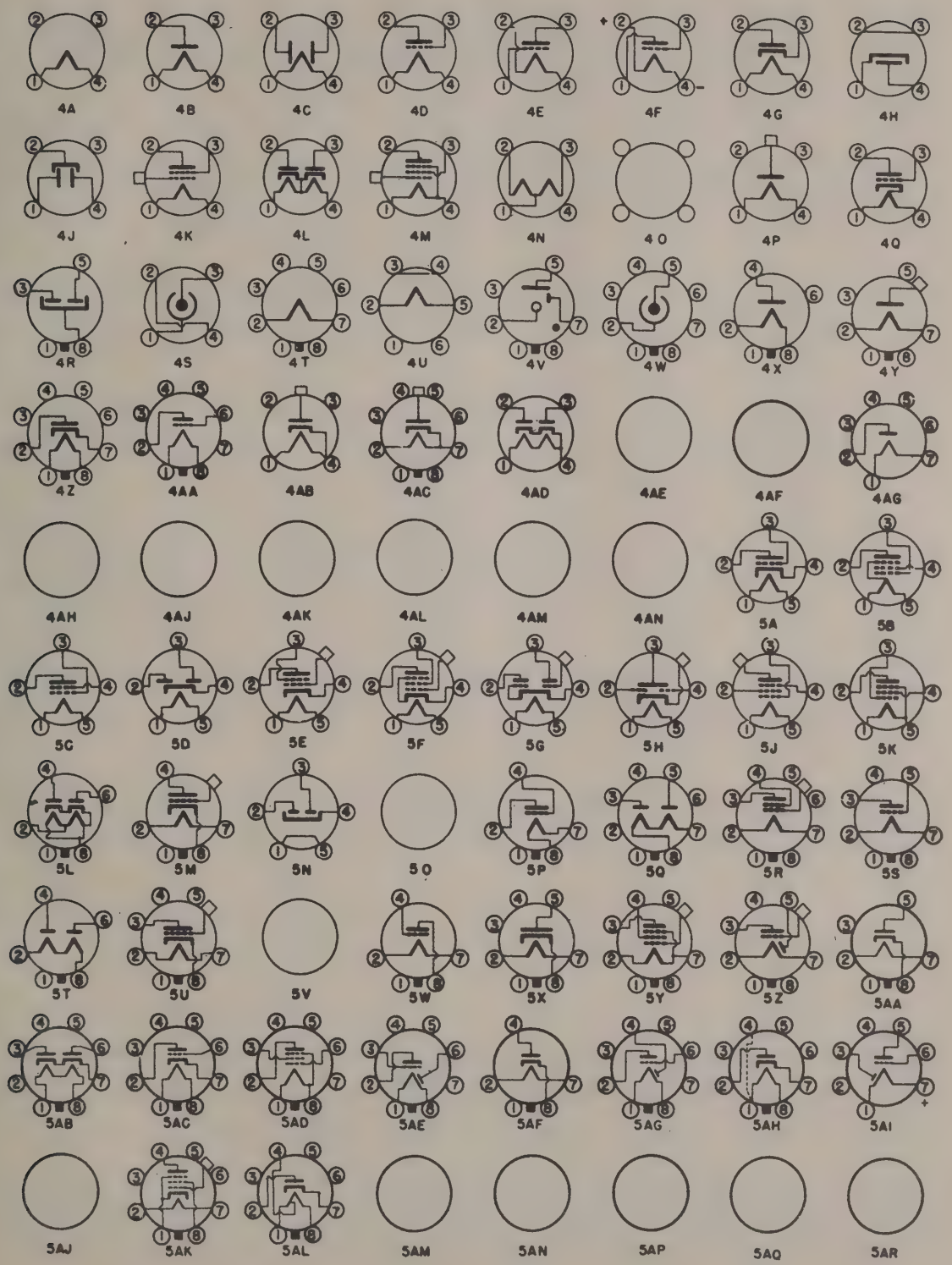
Figure 13

Diagram of internal connections of Model 666 Type 1C Socket Selector. Looking at back of panel.

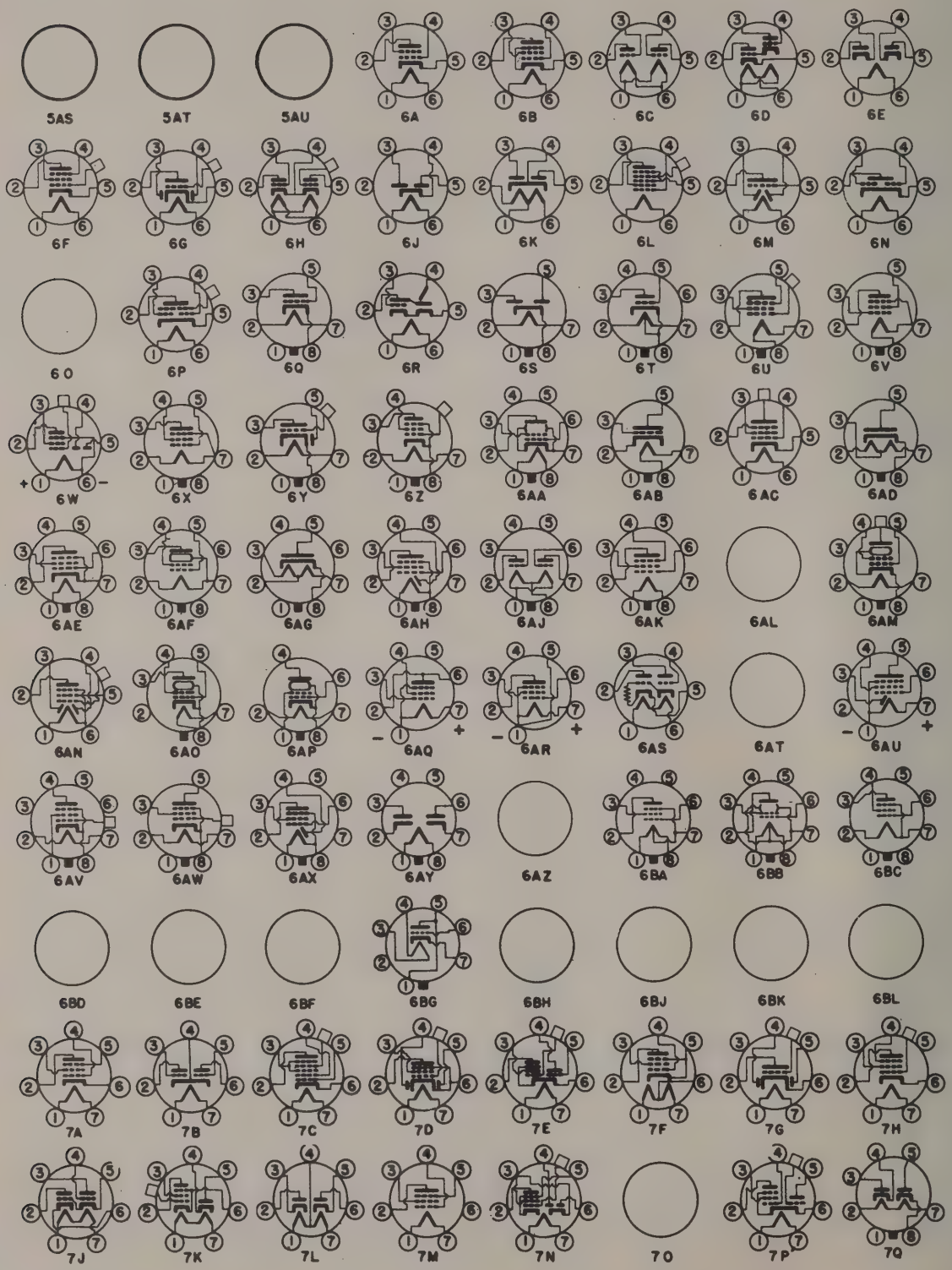
SECTION V

SUPPLEMENTARY DATA

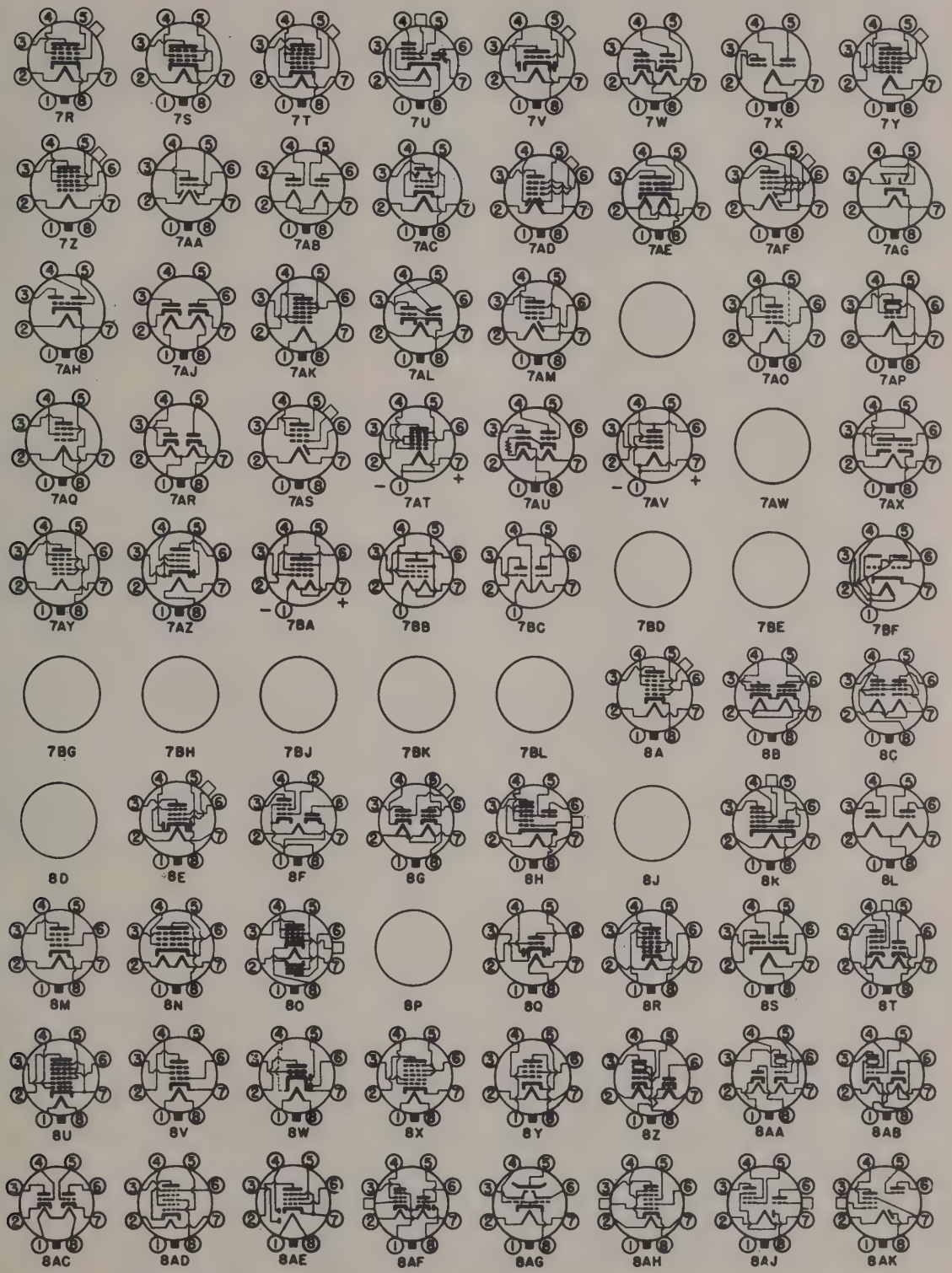
16. TUBE BASE DATA CONNECTIONS AND CHART



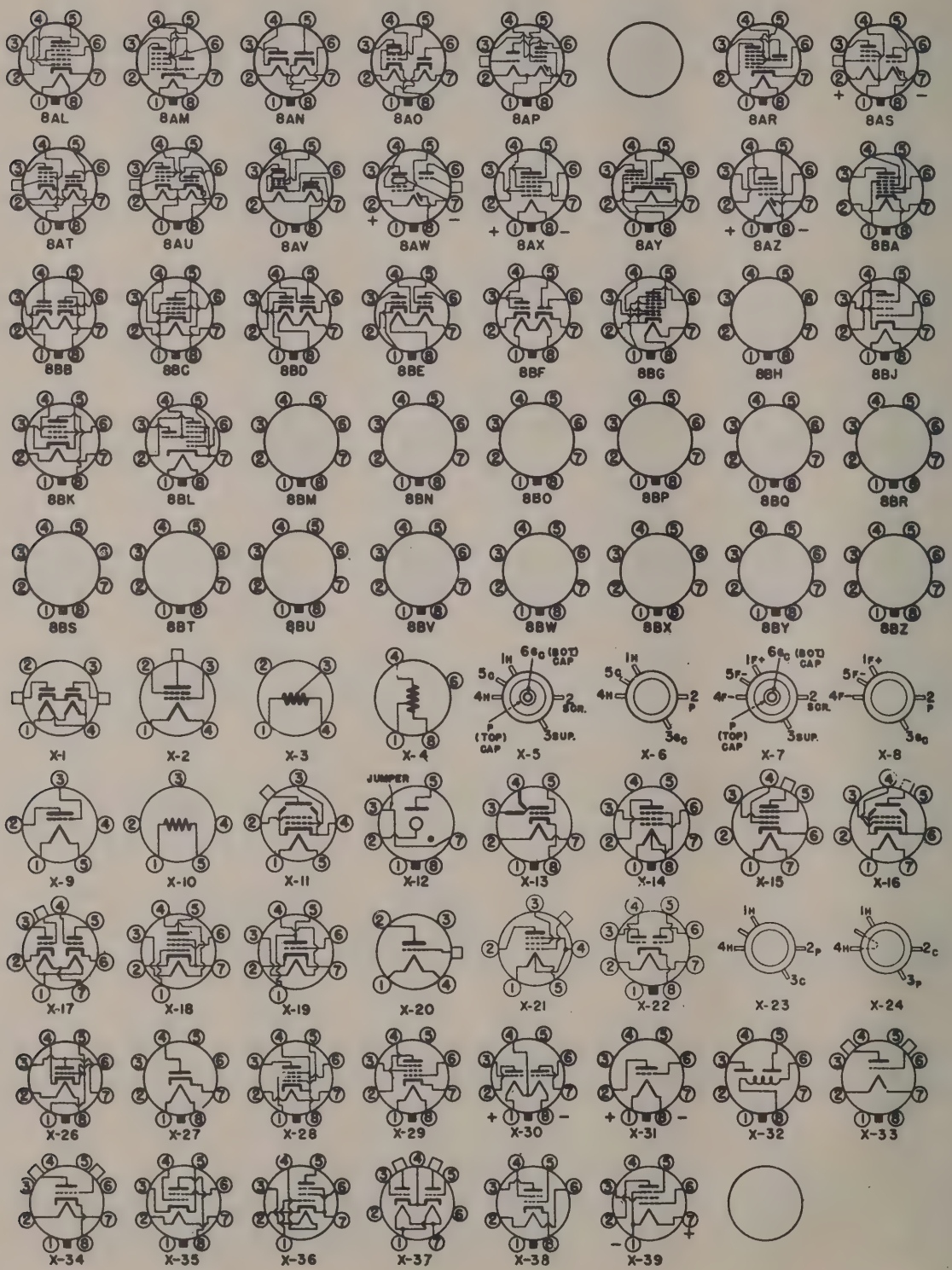
16. TUBE BASE DATA CONNECTIONS AND CHART (Continued)



16. TUBE BASE DATA CONNECTIONS AND CHART (Continued)



16. TUBE BASE DATA CONNECTIONS AND CHART (Continued)



16. TUBE BASE DATA CONNECTIONS AND CHART (Continued)

Tube Type	Base	Tube Type	Base	Tube Type	Base	Tube Type	Base	Tube Type	Base
00	4D	1N6-G	7AM	6AC6-G	7W	6N7	8B	7N7	8AC
00A	4D	1P1	4T	6AC7/1852	8N	6P5-G	6Q	7Q7	8AL
0A4	4V	1P5-G	5Y	6AD5-G	6Q	6P7-G	7U	7R7	8AE
0Z3	5N	1Q1	4T	6AD6-G	7AG	6Q6-G	6Y	7S7	8BL
0Z4	4R	1Q5-GT	6AF	6AD7-G	8AY	6Q7	7V	7T7	X-29
01	4D	1R1-G	4T	6AE5-GT	6Q	6R6-G	6AW	7V7	8V
01A	4D	1R5	7AT	6AE6-G	7AH	6R7	7V	7W7	8BJ
01AA	4D	1S1-G	4T	6AE7-GT	7AX	6S6-GT	5AK	7Y4	5AB
01B	4D	1S4	7AV	6AF5-G	6Q	6S7-G	7R	7Z4	5AB
1	4G	1S5	6AU	6AF6-G	7AG	6SA7	8R	8	4A
1A1	4A	1T1-G	4T	6AF7	8AG	6SA7-GT	8AD	9	4A
1A3	5AP	1T4	6AR	6AG5	X-36	6SC7	8S	10	4D
1A4-P	4M	1T5-GT	6X	6AG7	8Y	6SD7-GT	8N	12A	4D
1A4-T	4K	1-V	4G	6AH5-G	6AP	6SE7-GT	8N	12A5	7F
1A5-G	6X	1V1	4A	6AH7-GT	8BE	6SF5	6AB	12A6	7AC
1A6-GT	6L	1Y1	4A	6AL6-G	6AM	6SF7	7AZ	12A7	7K
1A6S	6L	1Z1	4A	6A7	7C	6SG7	8BC	12A8-GT	8A
1A7-G	7Z	2	4A	6A7-M	8A	6SH7	8BK	12AH7-GT	8BE
1B1	4A	2A3	4D	6A7-S	7C	6SJ7	8N	12B7	8V
1B4	4K	2A3-H	4Q	6A8	8A	6SK7	8N	12B8-GT	8T
1B4-P	4M	2A4-G	5S	6B4-G	5S	6SL7-GT	8BD	12C8	8E
1B5/25S	6M	2A5	6B	6B5	6AS	6SN7-GT	8BD	12E5-GT	6Q
1B7-G	7Z	2A6	6G	6B6-G	7V	6SQ7	8Q	12F5-GT	5M
1C1	4A	2A7	7C	6B7	7D	6SR7	8Q	12G7	7V
1C5-G	6X	2B6	7J	6B8	8E	6SS7	8N	12H6	7Q
1C6	6L	2B7	7D	6C4	6BG	6ST7	8Q	12J5-GT	6Q
1C7-G	7Z	2E5	6R	6C5	6Q	6T5	6R	12J7-GT	7R
1D1	4A	2G5	6R	6C5-G	6Q	6T7-G	7V	12K7-GT	7R
1D5-GP	5Y	2S/4S	5D	6C6	6F	6U5/6G5	6R	12K8	8K
1D5-GT	5R	2V3-G	4Y	6C7	7G	6U6-GT	7AC	12Q7-GT	7V
1D7-G	7Z	2W3	4X	6C8-G	8G	6U7-G	7R	12SA7	8R
1D8-GT	8AJ	2X2/879	4AB	6D5	6Q	6V6	7AC	12SA7-GT	8AD
1E1	4A	2Y2	4AB	6D6	6F	6V7-G	7V	12SC7	8S
1E4-G	5S	2Y3	4C	6D7	7H	6W5-G	6S	12SF5	6AB
1E5-G	5R	2Y4	5D	6D8-G	8A	6W6-GT	7AC	12SF7	7AZ
1E5-GP	5Y	2Z2	4B	6E5	6R	6W7-G	7R	12SG7	8BC
1E7-G	8C	3	4A	6E6	7B	6X5	6S	12SH7	8BK
1F1	4A	3A4	7BB	6E7	7H	6Y3	4AC	12SJ7	8N
1F4	5K	3A5	7BC	6F5	5M	6Y5	6J	12SK7	8N
1F5-G	6X	3A8-GT	8AS	6F5-G	5M	6Y6-G	7AC	12SL7-GT	8BD
1F6	6W	3C5-GT	7AQ	6F6	7S	6Y7-G	8B	12SN7-GT	8BD
1F7-G	7AD	3LE4	X-14	6F7	7E	6Z3	4G	12SQ7	8Q
1F7-GH	7AD	3LF4	6BB	6F7-S	7E	6Z4	5D	12SR7	8Q
1F7-GV	7AD	3Q4	7BA	6F8-G	8G	6Z5	6K	12Z3	4Q
1G1	4A	3Q5-GT	7AP	6G5	6R	6Z6	7Q	12Z5	6K
1G4-G	5S	3S4	7BA	6G6-G	7S	6Z7-G	8B	14	5E
1G5-G	6X	4	4A	6G7	7N	6ZY5-G	6S	14A4	5AC
1G6-G	7AB	4A6-G	8L	6G7S	7N	7	4A	14A5	6AA
1H4-G	5S	4S	5D	6H4-GT	5AF	7A4	5AC	14A7	8V
1H5-G	5Z	5	4A	6H5	6R	7A5	6AA	14B6	8W
1H6-G	7AA	5T4	5T	6H6	7Q	7A6	7AJ	14B8	8X
1J1	4A	5U4-G	5T	6H7	7P	7A7-LM	8V	14C5	6AA
1J5-G	6X	5V4-G	5L	6H7-S	7P	7A8	8U	14C7	8V
1J6-G	7AB	5W4	5T	6H8	8E	7B4	5AC	14E6	8W
1K1	4A	5X3	4C	6J5	6Q	7B5	6AE	14F7	8AC
1L1	4T	5X4-G	5Q	6J6	7BF	7B6	8W	14H7	8V
1L4	X-39	5Y3-G	5T	6J7	7R	7B7	8V	14J7	8AR
1LA4	5AD	5Y4-G	5Q	6J7-G	7R	7B8	8X	14N7	8AC
1LA6	7AK	5Z3	4C	6J7-GT	7R	7C5	6AA	14Q7	8AL
1LB4	5AD	5Z4	5L	6J8-G	8H	7C6	8W	14R7	8AE
1LB6	8AX	6	4A	6K5-G	5U	7C7	8V	14S7	8BL
1LC5	7AO	6A3	4D	6K6-G	7S	7E6	8W	14W7	8BJ
1LC6	7AK	6A4/LA	5B	6K7	7R	7E7	8AE	14Y4	5AB
1LD5	6AX	6A5-G	6T	6K8	8K	7F7	8AC	14Z3	4G
1LE3	4AA	6A6	7B	6L5-G	6Q	7G7	8V	15	5F
1LH4	5AG	6AB5	6R	6L6	7AC	7H7	8V	17	5A
1LN5	7AO	6AB6	7AU	6L7	7T	7J7	8AR	18	6B
1N1	4T	6AB7/1853	8N	6N5	6R	7K7	8BF	19	6C
1N5-G	5Y	6AC5-G	6Q	6N6-G	7AU	7L7	8V	20	4D

16. TUBE BASE DATA CONNECTIONS AND CHART (Continued)

Tube Type	Base	Tube Type	Base	Tube Type	Base	Tube Type	Base	Tube Type	Base
22	4K	49	5-C	90	6N	958	X-8	D-½	4B
24A	5E	49A2	X-4	91	6N	959	X-7	D-1	4C
24S	5E	49B2	X-4	92	6N	985	5D	DE	4D
25	6M	50	4D	95	6B	986	4C	E	4D
25A6	7S	50A5	6AA	96	4G	1201	X-26	G	4D
25A7-G	8F	50C6-G	7AC	98	5D	1203	X-27	GA	5B
25AC5-GT	6Q	50L6-GT	7AC	112A	4D	1204	X-28	G-2	5D
25B5	6D	50Y6-GT	7Q	117L7-GT	8AO	1221	6F	G-2S	5D
25B6-G	7S	50Z6-G	7Q	117M7-GT	8AO	1223	7R	G-4	5D
25B8-GT	8T	50Z7-G	8AN	117N7-GT	8AV	1231	8V	G-4S	5D
25C6-G	7AC	51	5E	117P7-GT	8AV	1232	8V	G-84	5D
25D8-GT	8AF	52	5C	117Z6-GT	7Q	1284	X-29	H	4D
25L6	7AC	53	7B	165R	4A	1291	X-30	HY-114B	X-33
25N6-G	7W	55	6Q	165R4	X-3	1293	X-31	HY-615B	X-34
25S	6M	56	5A	165R8	X-3	1294	X-27	K-24	5E
25X6-GT	7Q	56AS	5A	181	4D	1299	6DB	K-27	5A
25Y4-GT	5AA	56S	5A	182A	4D	1602	4D	KR-1	4G
25Y5	6E	57	6F	182B	4D	1603	6F	KR-2	4G
25Z3	4G	57AS	6F	183/483	4D	1609	5K	KR-5	5B
25Z4	5AA	57S	6F	185R	4A	1612	7T	KR-20	6N
25Z5	6E	58	6F	185R4	X-3	1613	7S	KR-22	6N
25Z6	7Q	58AS	6F	185R8	X-3	1614	7AC	KR-25	6B
26	4D	58S	6F	210T	4D	1620	7R	KR-28	5D
27	5A	59	7A	213	4C	1621	7S	KR-31	4G
27HM	5A	59A	7A	213B	4C	1622	7AC	KR-98	5D
27S	5A	59S	7A	216	4B	1625	X-16	KR-7184	X-38
29	6N	64	5E	216B	4B	1626	6Q	LA	5B
30	4D	65	5E	257	5B	1629	X-13	P-861	5D
31	4D	67	5A	264	4D	1631	7AC	PZ	5B
32	4K	68	5E	291	5G	1632	7AC	PZH	5B
32L7-GT	8Z	69	5E	293	5G	1633	8BD	RA-1	4Q
33	5K	70	6N	295	5G	1634	8S	RE-1	4C
34	4M	70A7-GT	8AB	482A	4D	1635	X-22	RE-2	4B
35	5E	70L7-GT	8AA	482B	4D	1642	X-17	RK-19	X-1
35A5-LT	6AA	71A	4D	483	4D	1851	7R	RK-21	4AB
35L6-GT	7AC	75	6G	484	5A	1852	8N	RK-22	X-1
35Y4	5AL	75M	7V	485	5A	1853	8N	RK-24	4D
35Z3-LT	4Z	75S	6G	486	X-9	9001	X-18	RK-33	X-17
35Z4-GT	5AA	76	5A	585	4D	9002	X-19	RK-34	X-37
35Z5-GT	6AD	77	6F	586	4D	9003	X-18	RK-47	5J
35Z6-G	7Q	77M	7R	801	4D	9004	X-23	RK-62	4D
36	5E	78	6F	803	5J	9005	X-24	SO-1	4Q
37	5A	78S	6F	804	5J	A (5)	5H	SO-2	4D
38	5F	79	6H	807	X-11	A (6)	6N	V-99	4E
39/44	5F	80	4C	837	X-15	A-22	4D	VR-50	4W
40	4D	81	4B	840	5J	A-26	4D	VR-75-30	X-12
40Z5	6AD	82	4C	841	4D	A-28	4D	VR-90-30	4W
41	6B	82V	4L	842	4D	A-30	4Q	VR-105-30	X-12
41M	7S	83	4C	843	5A	A-32	4Q	VR-150-30	X-12
42	6B	83V	4L	864	4D	A-40	4Q	WE-215A	4D
42A2	X-4	84/6Z4	5D	865	X-2	A-48	4Q	WE-231D	4D
42B2	X-4	85	6G	874	4S	AC-22	5E	WE-257A	X-20
43	6B	85AS	6G	878	4P	AD	4G	WE-300A	4D
43-MG	7S	85L7	8AB	879	4AB	AF	4C	WE-300B	4D
44	5F	85M	7V	884	6Q	AG	4C	WE-306A	X-21
45	4D	85S	6G	885	5A	AX	4Q	WE-307A	5J
45Z3	5AM	86M	6Q	950	5K	B	4E	WE-350A	X-11
45Z5-GT	6AD	87S	6F	951	4K	BA	4J	WE-713A	8BK
46	5C	88	4C	954	X-5	BH	4J	WE-717A	X-35
46A1	X-10	88S	6F	955	X-6	BR	4H	X-99	4D
46B1	X-10	89	6F	956	X-5	BX	4D	XXD	8AC
47	5B	89RS	7N	957	X-8	CK-1005	X-32	XXL	5AC
48	6A								

17. TEST DATA FOR SIGNAL CORPS TUBES ON MODEL 774-4

Tube Type	Fil. Sel.	Tube Sel.	IN Pos.
VT-25	7	38	BC
VT-25-A	7	38	BC
VT-27 Bat.	2	19	BC
VT-28*	3	40	BCE
VT-29	3	39	BC
VT-30	5	36	BC
VT-31 Bat.	2	19	BC
VT-33 Bat.	2	24	BCG
VT-35*	3	40	BCE
VT-36*	6	40	BCE
VT-37*	6	39	BC
VT-38*	6	39	BCE
VT-44 Bat.	2	20	BCE
VT-45	3	41	BC
VT-47	3	41	BCG
VT-48*	6	42	BCF
VT-49*	6	41	BCE
VT-50	7	37	BC
VT-51	7	38	BC
VT-52	7	40	BC
VT-54 Bat.	2	20	BCE
VT-55	7	20	BCE
VT-56*	3	41	BC
VT-57*	3	42	BCEF
VT-58*	3	42	BCEF
VT-63	3	41	BCG
VT-65*	6	41	BD
VT-66*	6	42	BCD
VT-67 Bat.	2	19	BC
VT-68*	6	37	BCE
VT-68 Di.	6	0	D&F
VT-69*	6	41	BCEF
VT-70*	6	24	DF
VT-70*	6	38	BCE
VT-72	7	40	BC
VT-73*	3	40	BC
VT-74	5	44	C&F
VT-75*	6	41	BE
VT-75 Di.	6	0	C&F
VT-76*	6	39	BC
VT-77*	6	41	BCEF
VT-78*	6	41	BCEF
VT-80	5	36	B&C
VT-83	5	43	B&C
VT-84*	6	42	B&C
VT-86*	6	40	BCDE
VT-86-A*	6	40	BCDE
VT-86-B*	6	40	BCDE
VT-87*	6	43	BCDE
VT-87-A*	6	43	BCDE
VT-88*	6	41	BE
VT-88 Di.	6	0	C&D
VT-88-A*	6	41	BE
VT-88-A Di.	6	0	C&D
VT-89*	6	40	BCEF
VT-90*	6	39	B&D
VT-91*	6	41	BCDE
VT-91-A*	6	41	BCDE
VT-92*	6	42	BE
VT-92 Di.	6	0	C&D
VT-92-A*	6	42	BE
VT-92-A Di.	6	0	C&D
VT-93*	6	38	BEF
VT-93 Di.	6	0	C&D
VT-94*	6	42	BD
VT-94-A*	6	42	BD
VT-94-D*	6	42	BD
VT-95	3	43	BC
VT-96*	6	41	BC&DF
VT-97	5	35	C&F
VT-98*	6	37	BCF
VT-99*	6	42	BE&DF
VT-101	8	44	CDEF
VT-103*††	6	41	FH
VT-103 Di.††	6	0	C&D
VT-104*††	8	41	FH
VT-104 Di.††	8	0	C&D
VT-105*††	6	40	BH&CD
VT-107*	6	42	BCD
VT-107-A*	6	42	BCD
VT-107-B*	6	42	BCD
VT-112*	6	45	BCFG
VT-114	5	42	C&F
VT-115*	6	43	BCD
VT-115-A*	6	43	BCD
VT-116*	6	42	BCFG
VT-116-B*	6	42	BCFG
VT-117*	6	42	BCFG
VT-120*	6	42	BCEF
VT-121*	6	43	BC
VT-124 Bat.	1	21	BCD
VT-125 Bat.	1	26	BCD
VT-126*	6	43	B&D
VT-126-A*	6	43	B&D
VT-126-B*	6	43	B&D
VT-131*	8	42	BCFG
VT-132*	8	44	BCDEF
VT-133*††	8	41	FH
VT-133 Di.††	8	0	C&D
VT-134*	8	42	BCD
VT-135*	8	42	BD
VT-135-A*	8	42	BD
VT-137*	8	41	BD
VT-138*	8	37	BCD
VT-145	5	39	B&C
VT-146 Bat.	1	22	BCE
VT-147 Bat.	1	23	BCDEF
VT-148 Bat.	1	22	BCD
VT-148 Bat.	1	15	EF
VT-148 Di.	1	0	G
VT-149 Bat.	3	24	ABCE
VT-149 Bat.†	3	20	ADF
VT-149 Di.†	3	0	AG
VT-150*	6	44	BCDGH
VT-151*	6	43	BCDEF
VT-151-B*	6	43	BCDEF
VT-152*	6	42	BCD
VT-153*	8	38	BEF
VT-153 Di.	8	0	C&D
VT-161*	8	44	BCDGH
VT-162*	8	42	BCFG
VT-163*	6	41	BE&DF
VT-164	3	42	BCDG
VT-165	3	42	BCE
VT-167	6	44	BCDEF
VT-168-A*	6	45	BCD
VT-169	8	38	BEF
VT-170 Bat.	2	20	BCE
VT-171 Bat.	1	25	BCFG
VT-172 Bat.	1	18	CDF
VT-172 Di.	1	0	B
VT-173 Bat.	1	25	BFG
VT-174 Bat.†	3	28	ABCFG
VT-175*	6	40	BCD
VT-176*	6	44	BCFG
VT-177 Bat.	1	18	BF
VT-177 Di.	1	0	D
VT-178 Bat.	1	17	BCDEF
VT-179 Bat.	1	24	BCDF
VT-180 Bat.†	3	32	ABCF
VT-181*	6	39	C&F
VT-182 Bat.†	3	30	ABC&AFG
VT-183 Di.	1	0	D
VT-185 Bat.†	3	32	ABCF
VT-188*	6	42	BC
VT-188 Di.	6	0	E&F
VT-189*	6	41	CD&EF
VT-190*	6	45	BCDF
VT-192*	6	43	BF
VT-193*	6	41	BCDF
VT-194*	6	44	BCDEF
VT-196*	6	43	B&D
VT-197-A	5	33	C&F
VT-198-A*	6	42	BCD
VT-199*	6	42	BCFG
VT-201*	9	45	BCD
VT-201-C*	9	45	BCD
VT-202*°††	6	43	BDF
VT-203*††	6	42	BDF
VT-205*††	6	41	FH
VT-205 Di.††	6	0	C&D
VT-206-A	5	44	C&F
VT-207*††	8	41	BG&DF
VT-208*	6	42	BCDEF
VT-209*	8	45	CFG
VT-210 Bat.§	1	26	BCFG
VT-211*	6	45	CFG
VT-212 Di.**	0	12	BC
VT-213-A*	6	41	BD
VT-214 Di.*	8	0	B&D
VT-215*	6	36	BCF
VT-221 Bat.†	3	28	ABCD
VT-223 Bat.	1	16	BE
VT-224*&	6	42	CE&EF
VT-225	5	39	BCEG
VT-227	6		BCD
VT-229*††	6	41	CD&GH
VT-231*††	6	43	CD&GH
VT-233*††	6	41	FH
VT-233 Di.††	6	0	C&D
VT-234°° Bat.	0	19	E
VT-235*°°	6	41	E
VT-237 Di.**	0	3	BC
VT-238*	6	43	BCEF
VT-239 Bat.	1	24	BF
VT-243 Di.*	6.3	0	D
VT-264 Bat.†	3	28	ABCFG
VT-268*††	8	41	BH&CD

° When short checking, B&D toggles should be thrown to IN and OUT simultaneously.

§ When testing for open elements or short checking, F&G toggles should be thrown to the IN and OUT simultaneously.

** Reject point is 16 on 50 Line DC. Arc.

† Turn switch A to IN position before inserting tube; keep in this position during complete test. A lighted neon lamp will indicate continuity of third filament connection. No short test; refer to instructions.

* Test for cathode leakage by throwing A switch to IN when tube is hot; all other switches should be at OUT

†† Test in A socket.

¶ Place Norm. Rev. toggle in rev. position; to short check, index A toggle to IN, leaving G at IN.

|| Place Norm. Rev. toggle at Rev.

& Move grid lead to the cap that gives the higher reading.

°° Tie both caps together.

□ When testing for open elements or short testing, B&H toggles should be thrown to IN and OUT together. The same holds for C&G toggles. Check for cathode leakage.

18. COMMERCIAL TUBE TEST DATA FOR MODEL 774-4

Tube Type	Fil. Sel.	Tube Sel.	IN Pos.
1A3§ Di.	1	0	FG
1A7-G Bat.	1	23	BCDEF
1C5-GT Bat.	1	26	BCD
1C7-G Bat.	2	23	BCDEF
1D7 Bat.	2	18	BCDEF
1D8-GT Bat.	1	22	BCD
1D8-GT Bat.	1	15	EF
1D8-GT Di.	1	0	G
1E5-GP Bat.	2	20	BCE
1F6-G Bat.	2	19	BCE
1F6-G Di.	2	0	F&G
1F7-GV Bat.	2	19	BEF
1F7-GV Di.	2	0	C&D
1G5 Bat.	2	25	BCD
1G6-G Bat.	1	23	BC&DF
1H5-GT Bat.	1	16	BE
1H5-GT Di.	1	0	D
1L4 Bat.	1	25	BGF
1LA4 Bat.	1	21	BCF
1LA6 Bat.	1	19	BCDEF
1LB4 Bat.	1	22	BCF
1LC5 Bat.	1	25	BCDF
1LC6 Bat.	1	17	BCDEF
1LD5 Bat.	1	21	BCF
1LD5 Di.	1	0	D
1LE3 Bat.	1	24	BF
1LH4 Bat.	1	18	BF
1LH4 Di.	1	0	D
1LN5 Bat.	1	24	BCDF
1N5-GT Bat.	1	22	BCE
1N6-G Bat.	1	21	BCD
1N6-G Di.	1	0	F
1P5-GT Bat.	1	22	BCE
1Q5-GT Bat.	1	28	BCD
1R5 Bat.	1	25	BCFG
1S4 Bat.§	1	26	BCFG
1S5 Bat.	1	18	CDF
1S5 Di.	1	0	B
1SA6-GT Bat.	1	24	BCFG
1SB6-GT Bat.	1	21	BCG
1T4 Bat.	1	25	BFG
1T5-GT Bat.	1	22	BCD
1-V*	6	43	B
2A3	3	43	BC
2A5*	3	41	BCF
2A6*	3	42	BE
2A6 Di.	3	0	C&F
2A7*	3	41	BCDEF
2B7*	3	35	BCE
2B7 Di.	3	0	D&F
3A4†§ Bat.	3	30	ABCFG
3A5† Bat.	3	29	ABG& ADF
3A8-GT Bat.†	3	24	ABCE
3A8-GT Bat.†	3	20	ADF
3A8-GT Di.†	3	0	AG
3B5-GT Bat.†	3	26	ABCD
3C5 Bat.†	3	27	ABCD
3LE4 Bat.†	3	28	ABCF
3LF4† Bat.	3	32	ABCF
3Q4 Bat.†	3	28	ABCFG
3Q5-GT Bat.†	3	28	ABCD
3S4 Bat.†	3	28	ABCFG
4A6-G Bat.†	4	24	ABC& ADF
5T4	5	42	C&F
5U4-G	5	39	C&F
5V4-G	5	44	C&F
5W4	5	35	C&F
5X4-G††	5	39	B&D
5Y3-G	5	33	C&F
5Y4-G††	5	33	B&D
5Z3	5	39	B&C
5Z4	5	44	C&F
6A7*	6	42	BCDEF
6A8*	6	43	BCDEF
6AB5/6N5*	6	33	BCF
6AB6-G*	6	37	BCD
6AB7/1853*	6	44	BCFG
6AC5-G*	6	42	BD
6AC6*	6	31	BCD
6AC7/1852*	6	45	BCFG
6AD7-G*	6	41	BCD
6AD7-G*	6	22	FH
6AE5-GT*	6	42	BD
6AE6-G*	6	41	BCD
6AE7-GT*	6	43	BCD
6AG5 Bat.*††	6	33	BDF
6AH7*††	6	41	BG&DF
6AG7*	6	43	CFGH
6AL6*	6	44	CDE
6B7*	6	37	BCE
6B7 Di.	6	0	D&F
6B8*	6	38	BEF
6B8 Di.	6	0	C&D
6C4††°*	6	42	BDF
6C5*	6	41	BD
6C6*	6	41	BCEF
6C7*	6	41	BE
6C7 Di..	6	0	D&F
6C8-G*	6	41	BE&DF
6D6*	6	41	BCEF
6D7*	6	42	BCDE
6D8-G*	6	40	BCDEF
6E5*	6	36	BCF
6E6*	6	40	BC&FG
6E7*	6	42	BCDE
6F5*	6	43	CE
6F6*	6	42	BCD
6F8-G*	6	42	BE&DF
6G6*	6	42	BCD
6H4-G Di.*	6	0	C
6H6*	6	39	B&D
6J5*	6	42	BD
6J6*††	6	44	BD&FG
6J7*	6	41	BCDE
6J8-G*	6	44	BCDEF
6K5-G*	6	42	BE
6K6-GT*	6	42	BCD
6K7*	6	40	BCDE
6K8*	6	41	BCDEF
6L5-G*	6	41	BD
6L6*	6	43	BCD
6L7*	6	43	BCDE
6N6-G*	6	40	BCD
6N7*	6	41	BC&DF
6P5-G*	6	39	BD
6P7-G*	6	40	CDE
6Q6*	6	41	BE
6Q6 Di.	6	0	D
6Q7*	6	42	BE
6Q7 Di.	6	0	C&D
6R6*	6	40	BDE
6R7*	6	41	BE
6R7 Di.	6	0	C&D
6S7*	6	41	BCDE
6SA7*	6	44	BCDGH
6SA7-G*	6	44	BCDG
6SC7††*	6	40	BH&CD
6SD7*	6	44	BCFG
6SF5†††*	6	43	BD
6SF7†††*	6	41	CFH
6SF7 Di.††	6	0	D
6SG7*	6	45	CFG
6SH7*	6	45	CFG
6SJ7*	6	42	BCFG
6SK7*	6	42	BCFG
6SL7††*	6	41	CD&GH
6SN7††*	6	43	CD&GH
6SQ7††*	6	41	FH
6SQ7 Di.††	6	0	C&D
6SR7††*	6	41	FH
6SR7 Di.††	6	0	C&D
6SS7*	6	42	BCFG
6ST7††*	6	41	FH
6ST7 Di.††	6	0	C&D
6T5*	6	36	BCF
6T7-G*	6	40	BE
6T7-G Di.	6	0	C&D
6U5/6G5*	6	37	BCF
6U6-G*	6	44	BCD
6U7-G*	6	41	BCDE
6V6*	6	42	BCD
6V7-G*	6	37	BE
6V7-G Di.	6	0	C&D
6X5*	6	43	B&D
6Y5*	6	43	B&G
6Y6-G*	6	45	BCD
6ZY5*	6	41	B&D
7A4*	6	43	BF
7A5*	6	44	BCF
7A6 Di.*	6	0	C&F
7A7*	6	43	BCDF
7A8*	6	42	BCDEF
7B4*	6	43	BF
7B5*	6	42	BCF
7B6*	6	42	BC
7B6 Di.	6	0	E&F
7B7*	6	42	BCDF
7B8*	6	42	BCDEF
7C5*	6	43	BCF
7C6*	6	40	BC

18. COMMERCIAL TUBE TEST DATA FOR MODEL 744-4 (Continued)

Tube Type	Fil. Sel.	Tube Sel.	IN Pos.
7C6 Di.	6	0	E&F
7C7*	6	41	BCDF
7E6*	6	42	BC
7E6 Di.	6	0	E&F
7E7*	6	40	BEF
7E7 Di.	6	0	C&D
7F7*	6	41	CD&EF
7G7 1232*	6	45	BCDF
7H7*	6	45	BCDF
7J7*	6	44	BCDEF
7L7*	6	44	BCDF
7N7*	6	43	CD&EF
7Q7*	6	44	BCDEF
7V7*	6	45	BCDF
7Y4*	6	42	C&F
7Z4*	6	39	C&F
10	7	38	BC
12A8-GT*	8	42	BCDEF
12AH7*††	8	41	BG&DF
12F5-GT*	8	42	BE
12H6* Di.	8	0	B&D
12J5-GT*	8	42	BD
12J7-GT*	8	42	BCDE
12K7-GT*	8	41	BCDE
12K8-GT*	8	44	BCDEF
12Q7-GT*	8	42	BE
12Q7-GT Di.	8	0	C&D
12SA7*	8	44	BCDGH
12SC7††	8	41	BH&CD
12SF5††	8	43	BD
12SF7††	8	41	CFH
12SF7 Di.††	8	0	D
12SG7*	8	45	CFG
12SH7*	8	45	CFG
12SJ7*	8	42	BCFG
12SK7*	8	42	BCFG
12SL7*††	8	41	CD&GH
12SN7*††	8	43	CD&GH
12SQ7††*	8	41	FH
12SQ7 Di.††	8	0	C&D
12SR7††*	8	41	FH
12SR7 Di.††	8	0	C&D
14A4*	8	43	BF
14A5*	8	42	BCF
14A7*	8	42	BCDF
14B6*	8	42	BC
14B6 Di.	8	0	E&F
14B8*	8	42	BCDEF
14C5*	8	43	BCF
14C7*	8	43	BCDF
14E6*	8	42	BC
14E6 Di.	8	0	E&F
14F7*	8	42	CD&EF
14H7*	8	45	BCDF
14J7*	8	44	BCDEF
14N7*	8	43	CD&EF
14Q7*	8	44	BCDEF
14S7*	8	45	BCDEF
14W7*	8	45	BCEF
14Y4*	8	42	C&F
14Z3*	8	43	B
24-A*	3	40	BCE
25A6*	9	42	BCD
25A7-G*	9	41	BCD
25A7-G*	9	44	F
25AC5*	9	42	BD
25L6-G*	9	45	BCD
25Z5*	9	44	B&G
26	1	36	BC
27*	3	39	BC
35A5*	10	44	BCF
35L6-GT*	10	44	BCD
35Y4†	10	45	AB
35Z3*	10	45	B
35Z4-GT*	10	45	D
35Z5-GT†	10	45	AD
35Z6*	10	45	B&D
35/51*	3	40	BCE
36*	6	40	BCE
37*	6	39	BC
38*	6	39	BCE
39/44*	6	41	BCE
41*	6	42	BCF
42*	6	39	BCF
43*	9	43	BCF
45Z3*§	11	44	FG
45Z5-GT†	11	45	AD
45	3	41	BC
50A5*	11	45	BCF
50C6*	11	44	BCD
50L6-GT*	11	45	BCD
50Y6-GT*	11	44	B&D
50Z6*	11	44	B&D
50Z7†	11	44	AB&AD
50	7	37	BC
53*	3	41	BC&FG
55*	3	37	BE
55 Di.	3	0	C&F
56*	3	41	BC
57*	3	42	BCEF
58*	3	42	BCEF
59*	3	40	BCDF
70A7-GT	12	45	BCD
70A7-GT‖	12	45	G
70L7-GT*	12	45	BCD
70L7-GT*	12	44	G
75*	6	41	BE
75 Di.	6	0	C&F
76*	6	39	BC
77*	6	41	BCEF
78*	6	41	BCEF
80	5	36	B&C
81	7	29	B
82	3	43	B&C
83	5	43	B&C
84/6Z4*	6	42	B&C
85*	6	37	BE
85 Di.	6	0	C&F
117L7-GT*	14	43	BCD
117L7-GT*	14	45	F
117N7-GT*	14	44	BCD
117N7-GT¶	14	45	GI
117P7-GT*	14	44	BCD
117P7-GT¶	14	45	GI
117Z4-GT*	14	44	D
117Z6-GT*	14	44	B&D
OZ4 Spec.	1	45	B&D
XXD*	8	41	CD&EF
XXL*	6	43	BF

° When short checking, B&D toggles should be thrown to the IN and OUT positions simultaneously.

§ When testing for open elements or short checking, F&G toggles should be thrown to IN and OUT simultaneously.

** Reject Point is 16 on 50 Line DC Arc.

† Turn switch A to IN before inserting tube; keep in this position during complete test. A lighted neon lamp will indicate continuity of third filament connection. No short test; refer to instructions.

* Test for cathode leakage by throwing A switch to IN when tube is hot; all other switches should be at OUT.

†† Test in A socket.

¶ Place Norm. Rev. toggle at Rev.; to short check, index A toggle to IN, leaving G at IN.

‖ Place Norm. Rev. toggle at Rev.

& Move grid lead to the cap that gives the higher reading.

°° Tie both caps together.

☐ When testing for open elements or short testing, B&H toggles should be thrown to IN and OUT simultaneously. The same holds for C&G toggles. Check for cathode leakage.

19. SUPPLEMENTARY COMMERCIAL TUBE TEST DATA

Tube Type	Fil. Sel.	Tube Sel.	IN Pos.
01A	5	36	BC
1A4-P Bat.	2	22	BCE
1A4-T Bat.	2	22	BCE
1A5-GT Bat.	1	21	BCD
1A6 Bat.	2	18	BCEFG
1B4-P Bat.	2	21	BCE
1B5/25S Bat.	2	17	BG
1B5/25S Di.	2	0	C&F
1B7 Bat.	1	19	BCDEF
1C6 Bat.	2	23	BCEFG
1D5-GP Bat.	2	21	BCE
1E4-G Bat.	1	23	BD
1E7-G Bat.	2	25	BCG& DFG
1F4 Bat.	2	26	BCG
1F5-G Bat.	2	26	BCD
1G4-G Bat.	1	23	BD
1H4-G Bat.	2	18	BD
1H6-G Bat.	2	19	BF
1H6-G Di.	2	0	C&D
1J5 Bat.	2	22	BCD
1J6-G Bat.	2	23	BC&DF
1R4/1294 Di.	1	0	D
2B6*	3	41	BDF
2E5*	3	32	BCF
2G5*	3	34	BCF
2W3	3	34	C
3B7/1291† Bat.	3	30	ABC & AFG
6A3	6	43	BC
6A4/LA	6	39	BCG
6A5-G†	6	44	ABD
6A6*	6	41	BC&FG
6B4-G	6	42	BD
6B5*	6	36	BCF
6B6*	6	41	BE
6B6 Di.	6	0	C&D
6F7*	6	38	BCE
6F7*	6	24	DF
6G7-S*	6	37	BE
6G7-S Di.	6	0	D&G
6H7-S*	6	41	BCD
6H7-S*	6	25	EF
6N5*	6	31	BCF
6W5-G*	6	43	B&D
6W6*	6	45	BCD
6W7-G*	6	42	BCDE
6Y7*	6	42	BC&DF
6Z3*	6	43	B
6Z7-G*	6	42	BC&DF
12-A	5	40	BC
12A5†	8	42	ABCD
12A6*	8	42	BCD
12A7*	8	38	BCE
12A7*	8	43	F
12B7*	8	42	BCDF
12B8-GT*	8	43	BCE
12B8-GT*	8	44	DG
12C8*	8	38	BEF
12C8 Di.	8	0	C&D
12E5-GT*	8	41	BD
12Z3*	8	44	B
12Z5/6Z5†	8	39	AB&AG
15 Bat.	2	16	BCE
18*	8	42	BFC
19 Bat.	2	20	BC&FG
25B5*	9	41	BCF
25B6-G*	9	44	BCD
25B8-GT*	9	43	BCE
25B8-GT*	9	44	DG
25C6-G*	9	45	BCD
25D8*	9	43	BCE
25D8*	9	42	DF
25D8 Di.	9	0	G
25N6-G*	9	40	BCD
25X6*	9	44	B&D
25Y5*	9	41	B&G
25Z3*	9	42	B
25Z6-GT*	9	44	B&D
30 Bat.	2	19	BC
31 Bat.	2	19	BC
32L7*	9	42	BCD
32L7*	9	43	F
32 Bat.	2	20	BCE
33 Bat.	2	24	BCG
34 Bat.	2	20	BCE
46	3	40	BCG
47	3	40	BCG
48*	9	43	BCF

19. SUPPLEMENTARY COMMERCIAL TUBE TEST DATA (Continued)

Tube Type	Fil. Sel.	Tube Sel.	IN Pos.
71-A	5	40	BC
79*	6	42	BC&EG
82V	3	43	B&C
83V	5	43	B&C
88M*	6	40	BCDE
89*	6	40	BCEF
183	5	39	BC
231-D Bat.	3	14	BC
239-A Bat.	1	14	BC
244-A*	2	37	BC
245-A*	2	31	BCE
252-A	5	39	BC
259-A*	2	40	BCE
262-A*	8	35	BE
271-A	5	36	BC
274-A	5	39	B&C
275-A	5	41	BC
283-A*	2	28	BCE
305-E	6	43	BCEF
307-A	5	39	BCEG
328*	7	39	BCEF
350-A*	6	45	BCE
482-A	5	39	BC
484*	4	42	BC
485*	4	42	BC
585	7	38	BC
586	7	38	BC
713-A* Bat.	6	33	CFG
717-A*°	6		CFG
802*	6	41	CDEF
837*	8	44	CDEF
841	7	38	BC
842	7	40	BC
864 Bat.	0	19	BC
865*	7	20	BCE
954*	6	42	BCEF
955*	6	43	BC
956*	6	43	BCEF
957** Di.	0	3	BC
958** Di.	0	12	BC
959** Di.	0	8	BCEF
986	5	43	B&C
1201□††	6	44	BCGH
1203* Di.	6	0	D
1204†† Bat.	6	29	BCH
1221*	6	40	BCEF
1223*	6	40	BCDE
1231*	6	46	BCDF
1232/7G7*	6	46	BCDF
1284*	8	42	BCDF
1291† Bat.	3	30	ABC& AFG
1293 Bat.	1	24	BF
1294 Di.	1	0	D
1299† Bat.	3	32	ABCF
1603*	6	40	BCEF
1610	3	40	BCG
1612*	6	43	BCDE
1619	3	42	BCDG
1620	6	42	BCDE
1621*	6	41	BCD
1622*	6	42	BCDE
1624	3	42	BCE
1626*	8	41	BD
1629*	8	37	BCD
1851*	6	44	BCDE
1852/6AC7*	6	45	BCFG
1853/6AB7*	6	44	BCFG
9001*††	6	42	BDF
9002*°††	6	43	BDF
9003*††	6	42	BDF
9004* Di.	6	0	B
9005 Di.	4	0	C
HY-114-B°° Bat.	0	19	E
HY-615*°°	6	41	E
KR-1*	6	43	B
KR-2*	5	44	B
KR-5	6	39	BCG
KR-25*	3	40	BCF
KR98			
01A	5	36	BC
0A4G Spec.	1	40	DEF
R-30	3	39	BC
R-100	5	30	B
R-200	5	33	B
RK-19	7	44	E
RK-24 Bat.	2	19	BC
RK-33*	6	42	CE&DF
RK34*&	6	42	CE&EF

° When short checking, B&D toggles should be thrown to the IN and OUT simultaneously.

§ When testing for open elements or short checking, F&G toggles should be thrown to IN and OUT simultaneously.

** Reject Point is 16 on 50 Line DC. Arc.

† Turn switch A to IN position before inserting tube; keep in this position during complete test. A lighted neon lamp will indicate continuity of third filament connection. No short test; refer to instructions.

* Test for cathode leakage by throwing A switch to IN position when tube is hot; all other switches should be in the OUT position.

†† Test in A socket.

¶ Place Norm. Rev. toggle in Rev. position to short check, index A toggle to IN position, leaving G in the IN position.

|| Place Norm. Rev. toggle in REV. position.

& Move grid lead to the cap that gives the higher reading.

°° Tie both caps together.

□ When testing for open elements or short testing, B&H toggles should be thrown to IN and OUT simultaneously. The same holds for C&G toggles. Check for cathode leakage.

20. CROSS INDEX OF VT AND COMMERCIAL TUBE TYPE NUMBERS

Signal Corps VT Tube Type	Commercial Tube Type
VT-25	10
VT-25-A	10 Special
VT-27 Bat.	30
VT-28	24A
VT-29	27
VT-30	01A
VT-31 Bat.	31
VT-33 Bat.	33
VT-35	35/51
VT-36	36
VT-37	37
VT-38	38
VT-44 Bat.	32
VT-45	45
VT-47	47
VT-48	41
VT-49	39/44
VT-50	50
VT-51	841
VT-52	45 Special
VT-54 Bat.	34
VT-55	865
VT-56	56
VT-57	57
VT-58	58
VT-63	46
VT-65	6C5
VT-66	6F6
VT-67 Bat.	30 Special
VT-68	6B7
VT-69	6D6
VT-70	6F7
VT-72	842
VT-73	843
VT-74	5Z4
VT-75	75
VT-76	76
VT-77	77
VT-78	78
VT-80	80
VT-83	83
VT-84	84
VT-86	6K7
VT-86-A	6K7-G
VT-86-B	6K7-GT
VT-87	6L7
VT-87-A	6L7-G
VT-88	6R7
VT-88-A	6R7-G
VT-89	89
VT-90 Di.	6H6
VT-91	6J7
VT-91-A	6J7-GT
VT-92	6Q7
VT-92-A	6Q7-G
VT-93	6B8
VT-94	6J5
VT-94-A	6J5-G
VT-94-D	6J5-GT
VT-95	2A3
VT-96	6N7
VT-97	5W4
VT-98	6U5/6G5
VT-99	6F8-G
VT-101	837
VT-103	6SQ7
VT-104	12SQ7
VT-105	6SC7
VT-107	6V6
VT-107-A	6V6-GT
VT-107-B	6V6-G
VT-112	6AC7/1852
VT-114	5T4
VT-115	6L6
VT-115-A	6L6-G
VT-116	6SJ7
VT-116-B	6SJ7 Special
VT-117	6SK7
VT-120	954
VT-121	955
VT-124 Bat.	1A5-GT
VT-125 Bat.	1C5-GT
VT-126	6X5
VT-126-A	6X5-G
VT-126-B	6X5-GT
VT-131	12SK7
VT-132	12K8
VT-133	12SR7
VT-134	12A6
VT-135	12J5-GT
VT-135-A	12J5
VT-137	1625
VT-138	1629
VT-145	5Z3
VT-146 Bat.	1N5-GT
VT-147 Bat.	1A7-GT
VT-148 Bat.	1D8-GT
VT-149 Bat.	3A8-GT
VT-150	6SA7
VT-151	6A8-G
VT-151-B	6A8-GT
VT-152	6K6-GT
VT-153	12C8 Special
VT-161	12SA7
VT-162	12SJ7
VT-163	6C8-G
VT-164	1619
VT-167	6K8
VT-168-A	6Y6-G
VT-169	12C8
VT-170 Bat.	1E5-GP
VT-171 Bat.	1R5
VT-172 Bat.	1S5
VT-173 Bat.	1T4
VT-174 Bat.	3S4
VT-175	1613
VT-176	1853
VT-177 Bat.	1LH4
VT-178 Bat.	1LC6
VT-179 Bat.	1LN5
VT-180 Bat.	3LF4
VT-181	7Z4
VT-182 Bat.	1291
VT-183 Di.	1294
VT-185 Bat.	1299
VT-188	7E6
VT-189	7F7
VT-190	7H7
VT-192	7A4
VT-193	7C7
VT-194	7J7
VT-196	6W5-G
VT-197-A	5Y3-G 5Y3-GT
VT-198-A	6G6-G
VT-199	6SS7
VT-201	25L6
VT-201-C	25L6-GT
VT-202	9002
VT-203	9003
VT-205	6ST7
VT-206-A	5V4-G
VT-207	12AH7-GT
VT-208	7B8-LM
VT-209	12SG7
VT-210 Bat.	1S4
VT-211	6SG7
VT-212 Di.	958
VT-213-A	6L5-G
VT-214 Di.	12H6
VT-215	6E5
VT-221 Bat.	3Q5-GT
VT-223 Bat.	1H5-GT
VT-224	RK-34
VT-225	WE307-A
VT-227	KR-7184
VT-229	6SL7-GT
VT-231	6SN7-GT
VT-233	6SR7
VT-234 Bat.	HY-114B
VT-235	HY-615
VT-237 Di.	957
VT-238	956
VT-239 Bat.	1LE3
VT-243 Di.	1203
VT-264 Bat.	3Q4
VT-268	12SC7

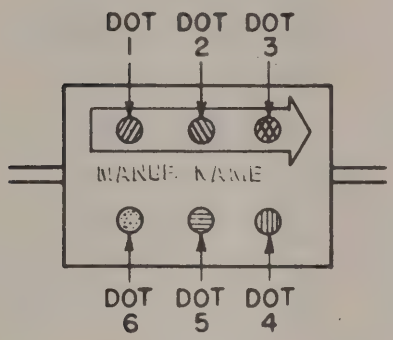
21. COLOR CODE CHARTS FOR RESISTORS AND CAPACITORS

AMERICAN WAR STANDARD

for

CAPACITORS

(MOLDED MICA)



COLOR	1st DOT 1st Digit	2nd DOT 2nd Digit	3rd DOT 3rd Digit	4th DOT Decimal Multiplier	5th DOT Tolerance	6th DOT Characteristics
BLACK	0	0	0	1	±20%	* A
BROWN	1	1	1	10		B
RED	2	2	2	100	± 2%	C
ORANGE	3	3	3	1,000		D
YELLOW	4	4	4	10,000		E
GREEN	5	5	5	100,000		F
BLUE	6	6	6	1,000,000		G
VIOLET	7	7	7	10,000,000		
GRAY	8	8	8	100,000,000		
WHITE	9	9	9	1,000,000,000		
GOLD	—	—	—	0.1	± 5%	
SILVER	—	—	—	0.01	± 10%	

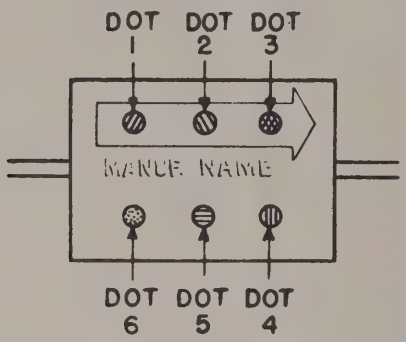
* A - ORDINARY MICA BY-PASS
B - SAME AS A - LOW LOSS CASE
C - BY-PASS OR SILVER MICA CAPACITOR (±200 PARTS / MILLION/C)
D - SILVER MICA CAPACITOR (±100 PARTS / MILLION / C)
E - SILVER MICA CAPACITOR (0 TO +100 PARTS / MILLION / C)
F - SILVER MICA CAPACITOR (0 TO +50 PARTS / MILLION / C)
G - SILVER MICA CAPACITOR (0 TO -50 PARTS / MILLION / C)

RMA. STANDARD

for

CAPACITORS

(MOLDED MICA)

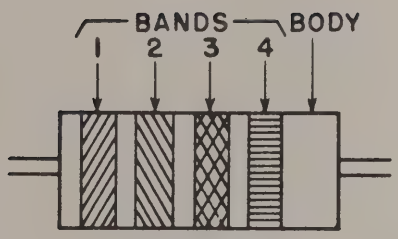


COLOR	1st DOT — *1st Digit*	2nd DOT — *2nd Digit*	3rd DOT — *3rd Digit*	4th DOT — *Decimal Multiplier*	5th DOT — *Tolerance*	6th DOT — *Voltage*
BLACK	0	0	0	1	–	–
BROWN	1	1	1	10	1%	100 v.
RED	2	2	2	100	2%	200 v.
ORANGE	3	3	3	1,000	3%	300 v.
YELLOW	4	4	4	10,000	4%	400 v.
GREEN	5	5	5	100,000	5%	500 v.
BLUE	6	6	6	1,000,000	6%	600 v.
VIOLET	7	7	7	10,000,000	7%	700 v.
GRAY	8	8	8	100,000,000	8%	800 v.
WHITE	9	9	9	1,000,000,000	9%	900 v.
GOLD	–	–	–	0.1		1,000 v.
SILVER	–	–	–	0.01	10%	2,000 v.
BODY	–	–	–	–	20%	500 v.

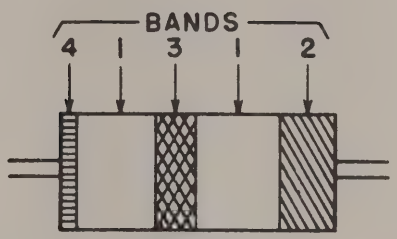
RMA STANDARD

for

RESISTORS



METHOD·1

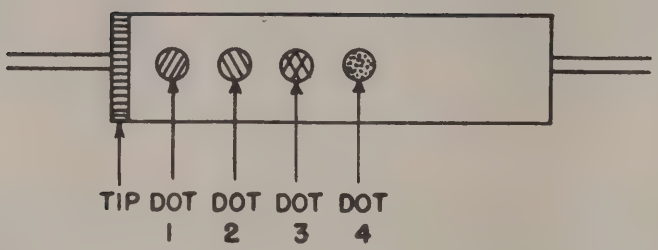


METHOD·2

COLOR	1st BAND *1st Digit*	2nd BAND *2nd Digit*	3rd BAND *Decimal Multiplier*	4th BAND *Tolerance*
BLACK	0	0	1	
BROWN	1	1	10	
RED	2	2	100	
ORANGE	3	3	1,000	
YELLOW	4	4	10,000	
GREEN	5	5	100,000	
BLUE	6	6	1,000,000	
VIOLET	7	7	10,000,000	
GRAY	8	8	100,000,000	
WHITE	9	9	1,000,000,000	
GOLD	—	—	—	±5%
SILVER	—	—	—	±10%
NO COLOR	—	—	—	±20%

COLOR CODE CHART

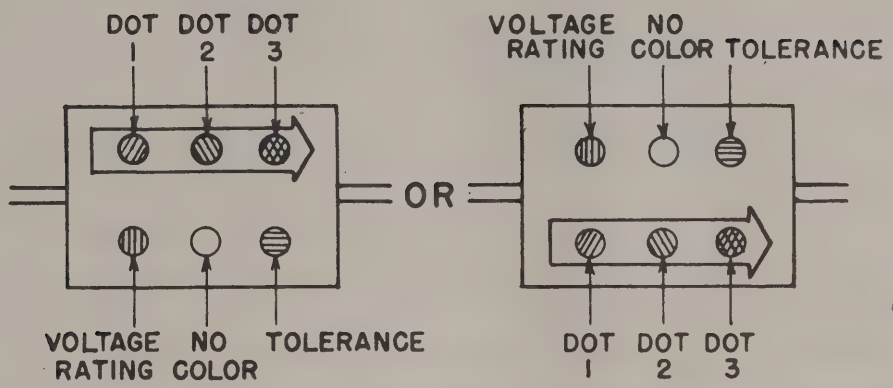
for
CAPACITORS
(TUBULAR CERAMIC)



COLOR	TIP *Temperature Coefficient*	1st DOT *1st Digit*	2nd DOT *2nd Digit*	3rd DOT *Decimal Multiplier*	4th DOT *Tolerance*
BLACK	0	0	0	1	—
BROWN	.00003 NEG.	1	1	10	1%
RED	.00008 "	2	2	100	2%
ORANGE	.00015 "	3	3	1,000	3%
YELLOW	.00022 "	4	4	10,000	4%
GREEN	.00033 "	5	5	100,000	5%
BLUE	.00047 "	6	6	1,000,000	6%
VIOLET	.00075 "	7	7	10,000,000	7%
GRAY		8	8	0.1	
WHITE		9	9	0.01	10%

COLOR CODE CHART

for
CAPACITORS



COLOR	1st DOT / 1st Digit	2nd DOT / 2nd Digit	3rd DOT / Decimal Multiplier	Tolerance	Voltage Rating
BLACK	0	0	1		
BROWN	1	1	10	1%	100 v.
RED	2	2	100	2%	200 v.
ORANGE	3	3	1,000	3%	300 v.
YELLOW	4	4	10,000	4%	400 v.
GREEN	5	5	100,000	5%	500 v.
BLUE	6	6	1,000,000	6%	600 v.
VIOLET	7	7	10,000,000	7%	700 v.
GRAY	8	8	100,000,000	8%	800 v.
WHITE	9	9	1,000,000,000	9%	900 v.
GOLD	—	—	0.1		1000 v.
SILVER	—	—	0.01	10%	2000 v.
BODY	—	—	—	20%	*

* WHEN NO COLOR IS INDICATED THE VOLTAGE RATING MAY BE AS LOW AS 300 VOLTS.

22. TABLE OF REPLACEABLE PARTS

*Note: No reference number given, as diagrams show directly essential identification information.

Sig. Corps Stock No.	Name of Part	Description	Function	Name or Sym. of Mfr.	Drawing No.
	Carrying Case	#19 gauge steel 19¼" x 13⅝" x 6⅜", with Sig. Corps nameplate per mfr's. drawing, D-79683	For carrying pocket meters, large analyzers, all leads, and instructions	W	D-106275
		MODEL 564 TYPE 3C VOLT-OHMMETER COMPLETE			
	Case	Moulded bakelite 5½" x 3⅝" x 1⅞", with Sig. Corps nameplate per mfr's. drawing, D-76981	For enclosing volt-ohmmeter	W	D-66311
	Cover	Moulded bakelite panel with glass, zero corrector, pin jack, rheostat, and switch mounting holes.	For carrying meter, etc.	W	D-106256
	Pin Jack	Standard phone tip jack ¼-32 thread to fit moulded panel.	To make test lead connections	Y	D-72923
	Switch	Single Pole Double Throw Toggle switch ¼" shank	To shift from volts to ohms	F	ND-20178
	Rheostat	10,000 Ω Approx. ¾" dia. Type PSM.	For battery adjustment	S	ND-22935
	Knob	Moulded bakelite, small diameter	For battery adjustment rheostat	W	ND-22899
	Clamp	Formed spring type to fit flat 3-cell 4.5-volt battery	For holding the ohmmeter battery	W	D-72901
	Terminal Plate	1/16" punched sheet bakelite 1⅝" x 2¾"	For mounting spools and other wire wound resistors	W	D-106258
	Resistor	1.2 Meg. Ceramic tube type	1800-volt range	I	D-106257
	Resistor	300,000-ohm spool Type RL	600-volt range	I	D-68068
	Resistor	270,000-ohm spool Type RL	300-volt range	I	D-65221
	Resistor	34,350-ohm spool Type RL	R x 1000 series	I	D-81250
	Resistor	29,880-ohm spool Type RL	R x 1000 shunt	I	D-81251
	Resistor	2,988-ohm spool Type RL	R x 100 shunt	I	D-81252
	Resistor	500-ohm spool Type WL	R x 100 series	I	D-81253
	Resistor	299-ohm spool Type WL	R x 10 shunt	I	D-81254
	Resistor	27,000-ohm spool Type RL	30-volt range	I	D-81257
	Resistor	29,240-ohm spool Type RL	3-volt series	I	D-81258
	Resistor	3,333-ohm spool Type RL	Voltmeter shunt	I	D-81259
	Resistor	33.2-ohm spool Type WL	R range shunt	I	D-79574
	Resistor	19-ohm spool Type WL	R x 10 series	I	D-79575
	Resistor	2,000-ohm ¼ w. carbon	Batt. adj. limiter	N	ND-21091
	Lead	Black rubber covered with terminal	Battery connection	W	D-73058
	Lead	Red rubber covered with terminal	Battery connection	W	D-73059

22. TABLE OF REPLACEABLE PARTS (Continued)

Sig. Corps Stock No.	Name of Part	Description	Function	Name or Sym. of Mfr.	Drawing No.
		MODEL 571 TYPE 3A OUTPUT METER			
	Meter	Model 301 mtd. on base	Indicator	W	Spec. 636-19
	Case	Moulded bakelite 5½" x 3⅝" x 1⅞", with Sig. Corps nameplate per Mfr's. drawing, D-79682.	For enclosing output meter	W	D-66311
	Cover	Moulded bakelite panel with glass and zero corrector, pin jack and rotary switch mounting holes	For carrying meter switch & pin jacks	W	D-73021
	Pin Jack	Standard phone tip jack ¼-32 thread to fit moulded panel	To make test lead connections	Y	D-72923
	Switch	Moulded bakelite, 5-pole single deck	Range selection	W	D-81221
	Dial	Moulded bakelite with a flat skirt for markings	Switch indexing	W	D-73702
	Resistor	3000-ohm resistor, type BCN	6-volt series	N	D-66198
	Resistor	300-ohm spool type RL	60-volt series	N	D-72942
	Resistor	600-ohm spool type SL	15-volt series	N	D-66196
	Resistor	888.9-ohm spool type RL	6-volt shunt	N	D-66194
	Resistor	40.4-ohm spool type RL	150-volt shunt	N	D-72914
	Resistor	60-ohm resistor type ALN	150-volt series	N	D-72928
	Resistor	62.1-ohm spool type RL	60-volt shunt	N	D-72905
	Resistor	341.9-ohm spool type RL	15-volt shunt	N	D-73868
	Capacitor	.1 mfd., 300 volt moulded, two in parallel. Micamold Type 345	D.C. blocking	M	ND-21763
	Meter	Model 301 mounted on base	Indicator	W	Spec. 645-19
		MODEL 774 TYPE 4 COMBINATION ANALYZER-TUBE CHECKER			
	Case	Wood 11¾" x 14" x 5⅞" with detachable cover and compartment for socket selector and adapters	Carrying the combination and necessary adapters	W	D-106274
	Panel	Screened steel with holes for sockets, meter, controls, and socket selector	Carries meter, controls, etc.	W	D-106277
	Socket	4-,5-,6-prong combination, per mfr's. drawing	Tube testing	A	D-106299
	Socket	7-prong, combination large and small per mfr's. drawing	Tube testing	A	D-106298
	Socket	7-prong miniature per mfr's. drawing	Tube testing	A	D-93590
	Socket	8-prong loctal per mfr's. drawing	Tube testing	A	D-93473
	Socket	8-prong octal per mfr's. drawing	Tube testing	A	D-106297

22. TABLE OF REPLACEABLE PARTS (Continued)

Sig. Corps Stock No.	Name of Part	Description	Function	Name or Sym. of Mfr.	Drawing No.
		MODEL 774 TYPE 4 COMBINATION ANALYZER-TUBE CHECKER—Continued			
	Socket	8-prong loctal per mfr's. drawing	Tube testing	A	D-108923
	Socket	Acorn per mfr's. drawing	Tube testing	A	D-91281
	Neon Lamp	G. E. ¼-watt, candelabra base	Short testing	G	ND-20284
	Socket	Candelabra with mounting bracket per mfr's. drawing	For neon lamp	D	D-85229
	Pin Jacks	Eby bakelite, #52K with locking clamp	To make test lead connections	E	ND-22752
	Rheostat	350-ohm vitreous type, 25-watt, with shaft drilled per mfr's. drawing	Line voltage control	H	D-85230
	Rotary Switch	4-deck assembled per mfr's. drawing	Range selection	Y	D-106273
	Rotary Switch	2-deck assembled per mfr's. drawing	Filament voltage selection	Y	D-106288
	Rotary Switch	6-deck assembled per mfr's. drawing	Circuit selector	Y	D-106272
	Potentiometer	2-deck 150 & 15,000 ohms per mfr's. drawing	Tube selector and ohmmeter adjuster	B	D-106265
	Bar knobs	Black moulded bakelite	For switches and potentiometer	W	D-83038
	Set screws	#729, pin type	For bar knobs	W	D-76857
	Switches	S.P.D.T. Toggle, red bakelite lever, ¼" shank	Tube testing	F	ND-22731
	Switch	D.P.D.T. toggle ¼" shank	Meter reversing	F	ND-22713
	Bracket	Steel, ½" strip stock, 6⅜" long, with tube socket bracket	For mounting transformer	W	D-106281
	Bracket	Steel ½" strip stock, 5¼" long	For mounting transformer (bottom)	W	D-106282
	Socket	4-prong Wafer, 1⅞" between mounting holes.	For mounting 71-A tube	C	J-11617
	Tube	Commercial 71-A	Short test and line voltage reading	R	ND-20775
	Transformer	Assembled with terminal plate & filament leads	Supplies all necessary potentials	W	D-106278
	Resistor	500,000-ohm ½-watt carbon	Neon lamp shunt	N	ND-20259
	Resistor	200,000 ohm ½-watt carbon	Neon lamp series	N	ND-22772
	Resistor Mtg. Plates	Sheet bakelite with terminals, 4" x 1¾"	For mtg. resistors	W	D-106276

22. TABLE OF REPLACEABLE PARTS (Continued)

Sig. Corps Stock No.	Name of Part	Description	Function	Name or Sym. of Mfr.	Drawing No.
		MODEL 774 TYPE 4 COMBINATION ANALYZER-TUBE CHECKER—Continued			
	Resistor	2000-ohm brown devil 2-watt	Tube load, special types	0	ND-22116
	Resistor Plate #1 assembled, includes the following matched pair resistors. This is the resistor plate nearest the panel. Refer to assembly drawing for location of each pair.		Assembly		D-106291
	Resistor	37,500-ohm carbon Type BT ½	Rx1000 range series	N	ND-22804
	Resistor	3,750-ohm carbon Type BT ½	Rx100 range series	N	ND-22805
	Resistor	26,224-ohm carbon Type BT ½	Rectifier series for capacity	N	ND-22806
	Resistor	70,300-ohm carbon Type BT ½	C+100 range series	N	ND-22807
	Resistor	.280-ohm carbon Type BW ½	500 MA range shunt	N	ND-22808
	Resistor	1.10-ohm carbon Type BW ½	100 MA range shunt	N	ND-22809
	Resistor	12.38-ohm carbon Type BW ½	10 MA range shunt	N	ND-22810
	Resistor	123.8-ohm carbon Type BW ½	1 MA range shunt	N	ND-22811
	Resistor	2087-ohm carbon Type BT ½	Meter series, for D.C. Volts 1M ohms/V	N	ND-22812
	Resistor Plate #2 assembled, includes the following matched pair resistors. This is the second resistor plate from the panel. Refer to assembly drawing for location of each pair.		Assembly		D-106290
	Resistor	76-ohm carbon Type BW ½	Cx10 range shunt	N	ND-22794
	Resistor	726-ohm carbon Type BW ½	C range shunt	N	ND-22795
	Resistor	9,500-ohm carbon Type BW ½	C+10 range shunt	N	ND-22796
	Resistor	686-ohm carbon Type BW ½	Rx100 range shunt	N	ND-22797
	Resistor	471.6-ohm carbon Type BW ½	Rx10 range shunt	N	ND-22798
	Resistor	49.4-ohm carbon Type BW ½	R Direct range shunt	N	ND-22799
	Resistor	11,500-ohm carbon Type BT ½	Meter series for ohms	N	ND-22800
	Resistor	4,000-ohm carbon Type BT ½ (Single, not paired)	Battery adjuster series	N	ND-22801
	Resistor	5 meg. carbon Type BT ½	1000 V series, 10M ohms/V	N	ND-22802
	Resistor	3.5 meg. carbon Type BT ½	500 V series, 10M ohms/V	N	ND-22803
	Resistor plate #3 assembled, includes the following matched pair resistors. This is the third resistor plate from the panel. Refer to assembly drawing for location of each pair.		Assembly		D-106289
	Resistor	.5 meg. carbon Type BT ½	1000 V. series 1M ohms/V	N	ND-22785

22. TABLE OF REPLACEABLE PARTS (Continued)

Sig. Corps Stock No.	Name of Part	Description	Function	Name or Sym. of Mfr.	Drawing No.
		MODEL 774 TYPE 4 COMBINATION ANALYZER-TUBE CHECKER—Continued			
	Resistor	.35 meg. carbon Type BT ½	500 V. series 1M ohms/V and 1000 V series 10M ohms/V	N	ND-22792
	Resistor	.1 meg. carbon Type BT ½	150 V. series 1M ohms/V	N	ND-22786
	Resistor	35,000-ohm carbon Type BT ½	50 V. series 1M ohms/V	N	ND-22787
	Resistor	7,500-ohm carbon Type BT ½	15 V. series 1M ohms/V	N	ND-22788
	Resistor	5,289-ohm carbon Type BT ½	7.5 V. series 1M ohms/V	N	ND-22789
	Resistor	73,800-ohm carbon Type BT ½	7.5 V. series 10M ohms/V	N	ND-22790
	Resistor	75,000-ohm carbon Type BT ½	15 V. series, 10M ohms/V	N	ND-22791
	Resistor	1 megohm carbon Type BT ½	150 V. series, 10M ohms/V	N	ND-22793
	Resistor Plate #4 assembled, includes the following matched pair resistors. This is the fourth resistor plate from the panel. Refer to manufacturer's assembly drawing for location of each pair.		Assembly		D-106292
	Resistor	3,664-ohm carbon Type BT ½	Rectifier bridge circuit	N	ND-22813
	Resistor	377-ohm carbon Type BW ½	Shunt for A-C volts	N	ND-22814
	Resistor	88.36-ohm carbon Type BW ½	Meter shunt for tube testing	N	ND-22815
	Resistor	300-ohm carbon Type BW ½	Tube testing	N	ND-22816
	Resistor	135,500-ohm carbon Type BT ½	Line check series	N	ND-22817
	Resistor	3,935-ohm carbon Type BT ½	Tube testing-diodes	N	ND-22818
	Resistor	765-ohm carbon Type BW ½	Tube testing-battery types	N	ND-22819
	Resistor	3,000-ohm carbon Type TB ½ Not Paired	Selected for line check adjustment, only 1 required	N	ND-21656
		6,000-ohm carbon Type TB ½ Not Paired			ND-22733
		9,000-ohm carbon Type TB ½ Not Paired			ND-22734
		12,000-ohm carbon Type TB ½ Not Paired			ND-22735
	Resistor	40-ohm wire wound Type BW ½	Tube testing	N	ND-22750
	Resistor	3-ohm wire-wound Type BW ½	Tube testing	N	ND-22749
	Resistor	165-ohm wire-wound Type BW ½	Tube testing	N	ND-22751
	Capacitor	.5 mfd. Solar Type MP 200-Volts D-C	Filter for short checking & line check potential	J	ND-21079
	Rectifier	Weston bridge type with brown dot	Instrument rectifier for A-C ranges	W	D-89368

22. TABLE OF REPLACEABLE PARTS (Continued)

Sig. Corps Stock No.	Name of Part	Description	Function	Name or Sym. of Mfr.	Drawing No.
		MODEL 774 TYPE 4 COMBINATION ANALYZER-TUBE CHECKER—Continued			
	Battery clamp	Weston type with snap ring	To hold 1.5-volt battery	W	D-106168
	Battery clamp	Formed spring type to fit flat 3-cell 4.5-volt battery	To hold 4.5-volt battery	W	D-108907
	Lead	Rubber covered with pin clip	Tube top cap connector Plate lead for Acorn tubes	W	D-91290
	Lead	Rubber covered with double cap connector	Tube top cap connector, other types	W	D-106295
	Line Cord	Complete with bakelite fused plug —Two 1 amp. fuses in plug	For A-C line connection	W	D-76868
	Meter	Model 801 complete	Indicator—all functions	W	Spec. M176-4
	Socket Selector	Model 666 Type 1-C-1	Analyzer Testing	W	D-106279
	Capacitor	.25 mfd. Solar Tubular Type 600 volts D-C	Series cap to pin jack for output meter readings	J	ND-21578
	The following socket and plug adapters are mounted in the wood block located in the Model 774 carrying case compartment:				
	Adapter	4-prong skirted (red)	For 4-prong tubes	W	D-70194
	Adapter	5-prong skirted (green)	For 5-prong tubes	W	D-70195
	Adapter	6-prong skirted (blue)	For 6-prong tubes	W	D-70196
	Adapter	7-prong skirted (black)	For large 7-prong tubes	W	D-70187
	Adapter	Octal skirted (orange)	For octal tubes	W	D-70131
	Adapter	Loctal skirted (brown)	For loctal tubes	W	D-70139
	Adapter	Miniature skirted (black)	For miniature tubes	W	D-70144
	Adapter	4-prong plug (red)	For 4-prong tubes	W	D-70120
	Adapter	5-prong plug (green)	For 5-prong tubes	W	D-70123
	Adapter	6-prong plug (blue)	For 6-prong tubes	W	D-70124
	Adapter	Small 7-prong plug (brown)	Small 7-prong tubes	W	D-70126
	Adapter	Large 7-prong plug (black)	Large 7-prong tubes	W	D-70127
	Adapter	8-prong octal plug (orange)	For octal tubes	W	D-70130
	Adapter	Loctal plug (brown)	For loctal tubes	W	D-70132
	Adapter	Miniature plug	For miniature tubes	W	D-70143

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